

SMITHSONIAN ZooGOER

For members of **FRIENDS OF THE NATIONAL ZOO**
MAY | JUNE | 2012

A FINE USE FOR feathers

Castoffs from Zoo birds
wind up in surprising places.

- » **New Salamander Lab**
- » **Asiatic Wild Dogs**
- » **Chambered Nautiluses**



Good day.

Great day.

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Feathers of a Bird

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picked up a few stray feathers.

With help from a passionate keeper,
that grew into a new frontier
of cross-cultural cooperation.

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BY ALLIE KILLAM

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been little studied and even less appreciated.
Researchers are trying to understand—and
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NUCHARIN SONGSAEN/NZP

SMITHSONIAN Zoogoer



is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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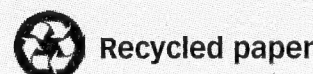
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On the cover: Eight kiwi chicks have hatched at the zoo.
PHOTO BY MEGHAN MURPHY/NZP

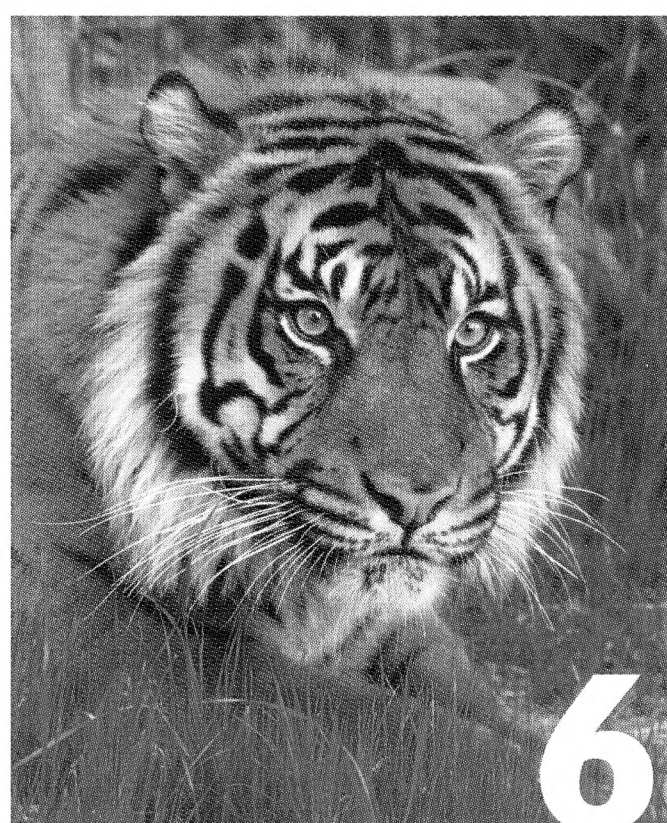
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MEGHAN MURPHY/NZP

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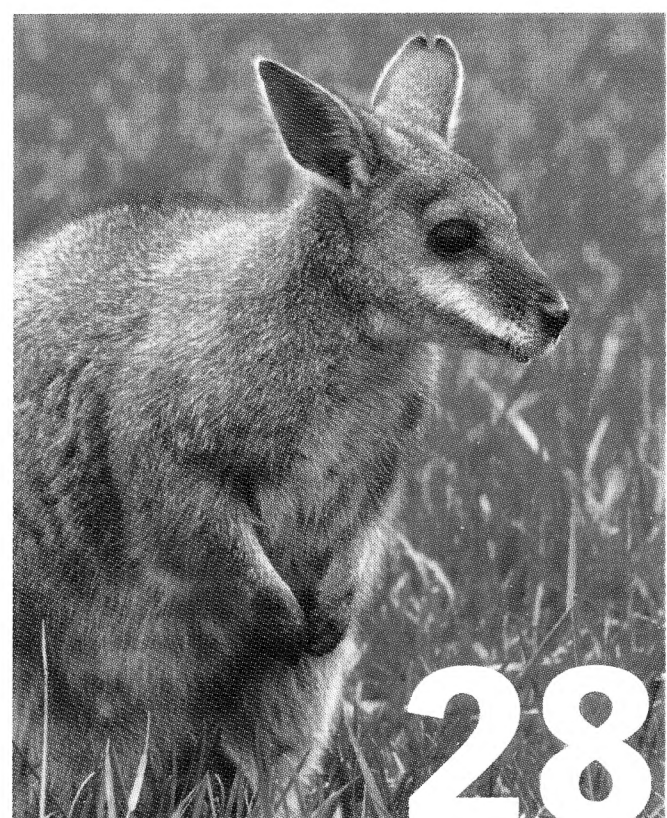
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MEGHAN MURPHY/NZP



JANICE SVEDA

A SPIRIT OF SERVICE

“THE ONLY ONES AMONG YOU WHO WILL BE REALLY HAPPY,”

said physician-humanitarian Albert Schweitzer, “are those who will have sought and found a way to serve.” His words have been in my mind as I prepared for, took part in, and reflected upon a recent retreat with our FONZ Board.

We gathered here at the Zoo to review the mission and strategic direction of FONZ and to see if we needed to make any changes to the strategic plan that was put into effect five years ago. The Board confirmed that the course we are taking remains a good one. That course centers on three strategic goals: providing an unsurpassed visitor experience, expanding the partnership relationship with the National Zoo and other partners, and achieving organizational excellence and financial strength. We also discussed many ways to continue to improve our organization and programs as we serve you, our members.

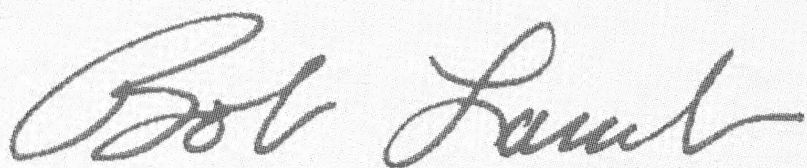
The biggest takeaway for me occurred the day after the retreat, when I thought about the service our 25 Board members contribute without compensation and with little recognition. They provide the overall guidance and direction for me, and they work on committees that range from finance to membership that meet regularly. They are an active, hands-on, committed Board. (See pg. 2 for a listing of Board members.) Members serve for up to nine years, and most continue to assist us long after their Board service ends.

The Board is just one example of the service culture that permeates FONZ. That same spirit shines forth in our volunteers, who form a backbone of service for the Zoo. Last year, some 1,500 volunteers contributed nearly 100,000 hours of work as Zoo guides, interpreters, zoo keeper aides, and special-event assistants.

Service is also the ethos of the 64 full-time employees and our expanded seasonal staff. To offer just one example, the FONZ staff regularly goes the extra mile to organize events such as ZooFari, Boo at the Zoo, and ZooLights. The time, creativity, and enthusiasm that employees pour into these events make it possible to bring you a wonderful Zoo experience.

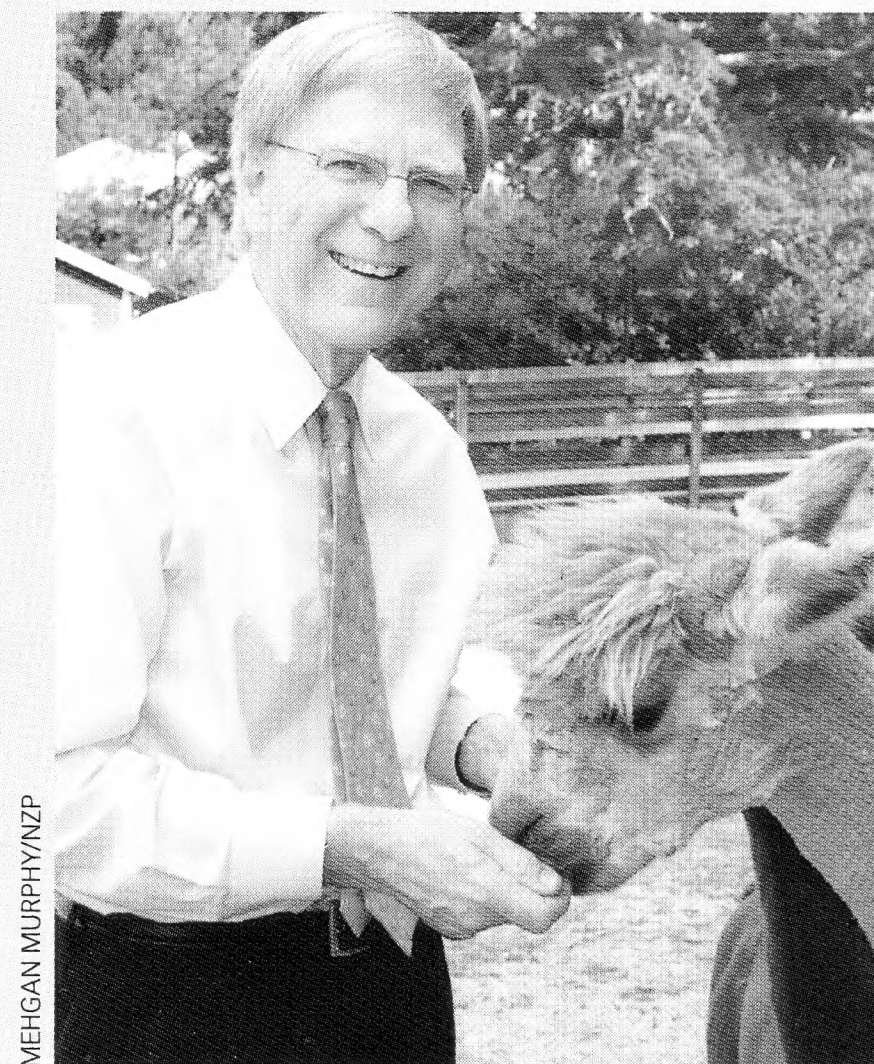
What underlies all of this is the spirit of service—which, as Albert Schweitzer noted, provides the most valuable of all rewards: the happiness of serving a great cause.

Sincerely,



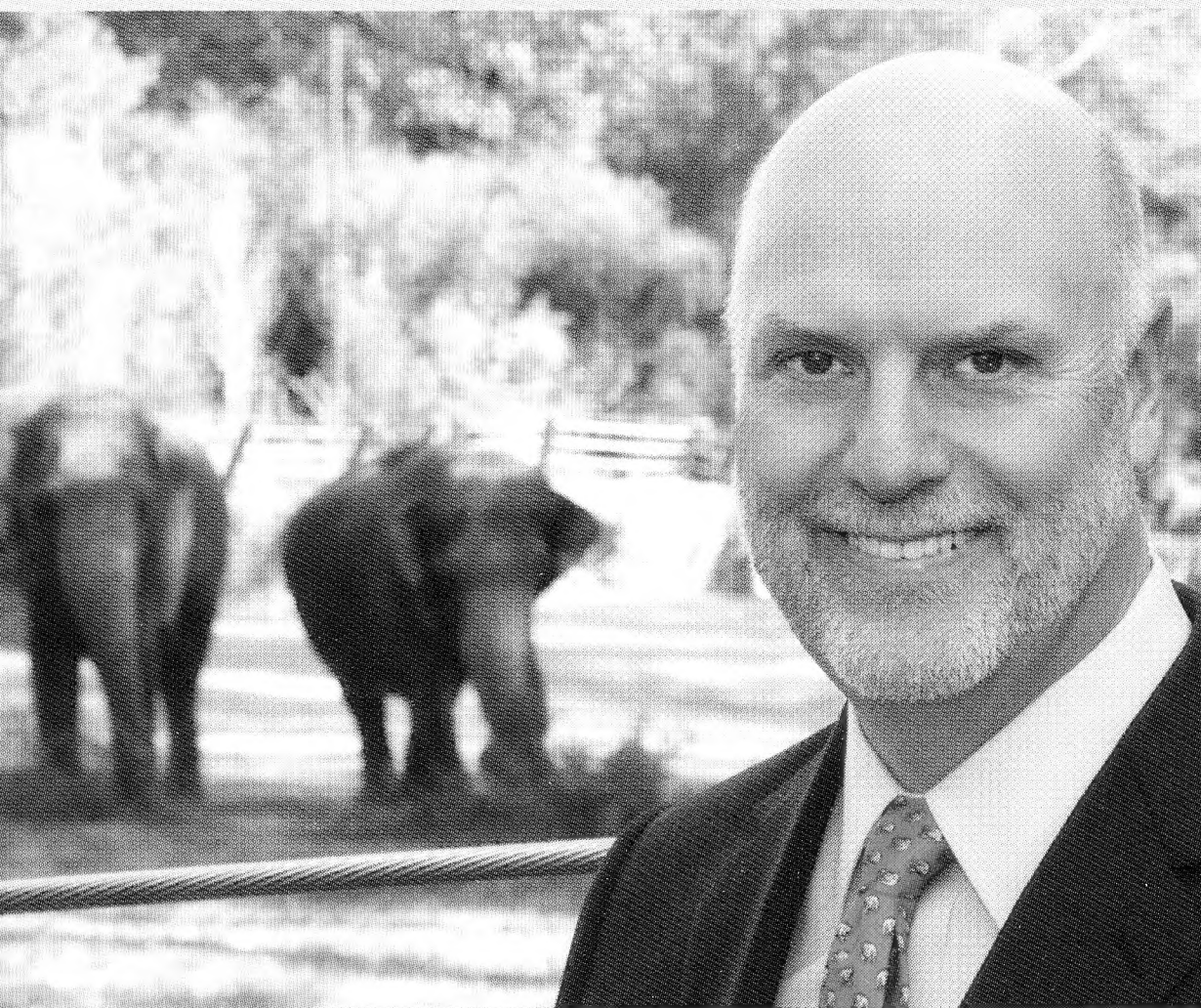
Bob Lamb

Executive Director, Friends of the National Zoo



MEGHAN MURPHY/NZP

A KEY SMITHSONIAN SUPPORT



MEGHAN MURPHY/NZP

SINCE 1966, THE SMITHSONIAN WOMEN'S COMMITTEE HAS BEEN A MAINSTAY OF THE INSTITUTION.

Founded by Mary Ripley, whose husband was a legendary Secretary of the Smithsonian, the Committee has raised and donated nearly ten million dollars to sustain the work of museums, galleries, scientific facilities—and the National Zoo. The Committee's spring craft show and fall Craft2Wear sale are its primary fund-raisers.

The Committee's largesse has benefited the Zoo in a variety of ways, from enriching exhibits here in the park to supporting research and conservation work around the globe. For the Zoo team, each Committee grant is a source of both gratitude and pride: gratitude for the continuing generosity of these vital Smithsonian benefactors and pride in our work's being deemed meritorious after rigorous scrutiny.

This past January, the Committee announced its two newest grants to the Zoo. One will enable Smithsonian Conservation Biology Institute scientists to conduct hormonal analyses on elephants in human care. This research will help scientists determine whether hormonal imbalances are disrupting the ovarian cycles of elephants in zoos. The second grant will underwrite educational outreach for Neighborhood Nestwatch, a Smithsonian Migratory Bird Center program that enlists

Washington-area residents to collect data on local birds.

You can observe the benefits of the Committee's work yourself on your next visit to the Small Mammal House. There you'll find "The Inside Story," a wonderful new exhibit that uses animal x-rays and artifacts to illumine the relationship between body structure and behavior. The exhibit focuses particularly on tails, skulls, and movement. Three other ways you might benefit directly from the Committee's generosity are by viewing the "Frog, Chemical, Water, You!" film in the Amazonia Science Gallery, marveling at the intelligence of the Norway rats at Think Tank, and downloading the "Zoo Crew Training Manual" (nationalzoo.si.edu/Education/images/FamilyGuide.pdf), a guide for families visiting the Zoo.

A world away from our Rock Creek campus, a trio from the Zoo landed late last fall in Bhutan, a small Asian kingdom nestled in the Himalayas. Two veterinarians and a research scientist, they conducted an intensive training course for Bhutanese veterinarians and forest officers, equipping them with the latest tools and techniques for studying and protecting their country's rich array of wildlife, which includes tigers, Himalayan black bears, Asian elephants, and much more. This urgently needed training (in a country that previously had a single wildlife veterinarian) could not have happened without the generous support of the Smithsonian Women's Committee.

Nor could any number of other projects, which space limitations preclude my describing in detail. They include a frozen-coral repository in Hawaii and kori bustard research in Kenya. Each undertaking—here or abroad, humble or ambitious—bears testimony to the creative vision and generous support of a group I'm grateful and proud to call one of the Zoo's great partners: the Smithsonian Women's Committee.

Sincerely,

Dennis Kelly

Director, Smithsonian's National Zoological Park

Marmoset Study Sheds Light on Obesity

Scientist Michael Power of the Smithsonian Conservation Biology Institute and several collaborators recently published the results of a year-long study of marmosets, small monkeys native to South America. The team found that marmosets which had more body fat at one month of age were more likely to be fat at the end of their first year.

Because both marmosets and humans, unlike most other animals, have a fair amount of body fat at birth, the marmoset findings may have implications for human health. "It seems like these animals are dividing into two groups at a very early age," says Power. "It appears that developing obesity is something that can happen to an animal or a human before they have a real choice."

SMITHSONIAN'S NATIONAL ZOO



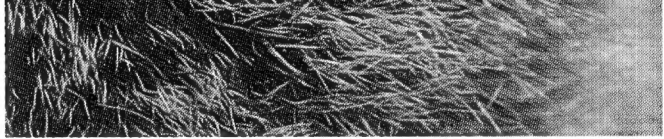
Rare Guam Rails Hatch

Two rare Guam rail chicks hatched at the Zoo in early March, bringing the global population to 162. These flightless birds once roamed the island of Guam. That changed after World War II, when brown tree snakes arrived on the island, most likely by stowing aboard military equipment. The serpents all but wiped out Guam rails, now classified as extinct in the wild, along with eight other bird species.

The Zoo has hatched 82 Guam rail chicks since 1986, donating 29 to the government of Guam and shipping 25 to other institutions. Guam is working to control its brown snake population, but deforestation and human expansion pose significant challenges to releasing Guam rails into the wild. Small populations live on Rota and Cocos, small islands near Guam.



JIM AND PAM JENKINS/FONZ PHOTO CLUB



Tian Tian Update

Giant panda keepers noticed in mid-March that Tian Tian was not at his best. He was eating less and producing some soft stool. During a medical exam, veterinarians found that the bear was suffering from a urinary tract infection and possible gastrointestinal upset. They prescribed a round of antibiotics and stomach medications, but Tian Tian still didn't return to his usual self.

After consulting with Chinese veterinary colleagues, Zoo curators and veterinarians decided to anesthetize Tian Tian for a complete medical workup. They found some signs of decreased muscle mass but nothing extraordinary or worrying. Meanwhile, the beloved bear has gained some weight and become more playful again.



JESSIE COHEN/NZP



NUCHARIN SONGSASEN/NZP

Maned Wolf Pups Get Exams and Names

The four maned wolf pups born in January in Front Royal underwent their first medical exams in mid-February. Veterinary technician Lisa Ware worked with animal care staff to perform the exams, insert identification transponders, and vaccinate the pups against distemper and panleukopenia. "All of the pups were bright, appeared in good health, and are starting to get just a little bit feisty," she reports. Each animal weighed about five pounds. The litter appears to include two males and two females, although the pups' sexes will be more accurately determined as they age.

The pups received names at the end of March. Generous donors named two of them Hope and Peak. Visitors to the Zoo's Facebook page voted on names for the remaining two pups, dubbing them Bella (Portuguese for "beautiful") and Rocko.



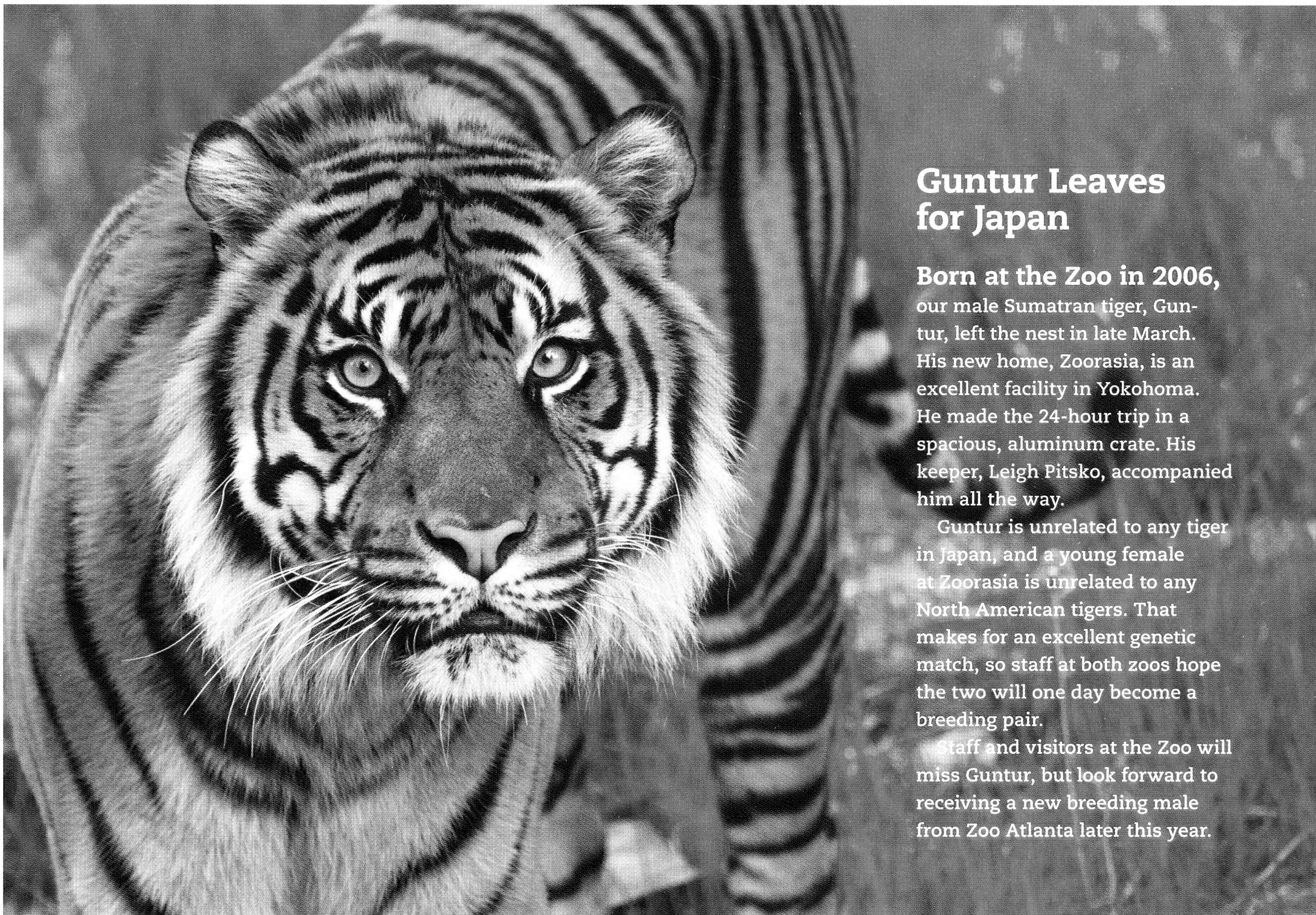
JIM JENKINS

Two New Kiwis

Two brown kiwis hatched at the Zoo in March, one at Rock Creek and the other in Front Royal. The Rock Creek chick, a curious little boy, hatched on March 7. Keeper Kathy Brader says, "He talks all the time and is definitely less shy than

most." Kiwi fans can watch his antics via web cam at nationalzoo.si.edu. Front Royal welcomed another male on March 11. Keeper Geoffrey Reynolds reports that the chick is "progressing by leaps and bounds."

Each hatching is a milestone for this endangered species, but the March 11 chick has special significance. That's because Warren Lynch, manager of the bird unit in Front Royal, was able to identify its sex by testing blood extracted from the egg. That had never been done with a kiwi before. In the future, telling the sex of a chick in advance could become an important tool for maintaining a male-female balance in the nonwild population.

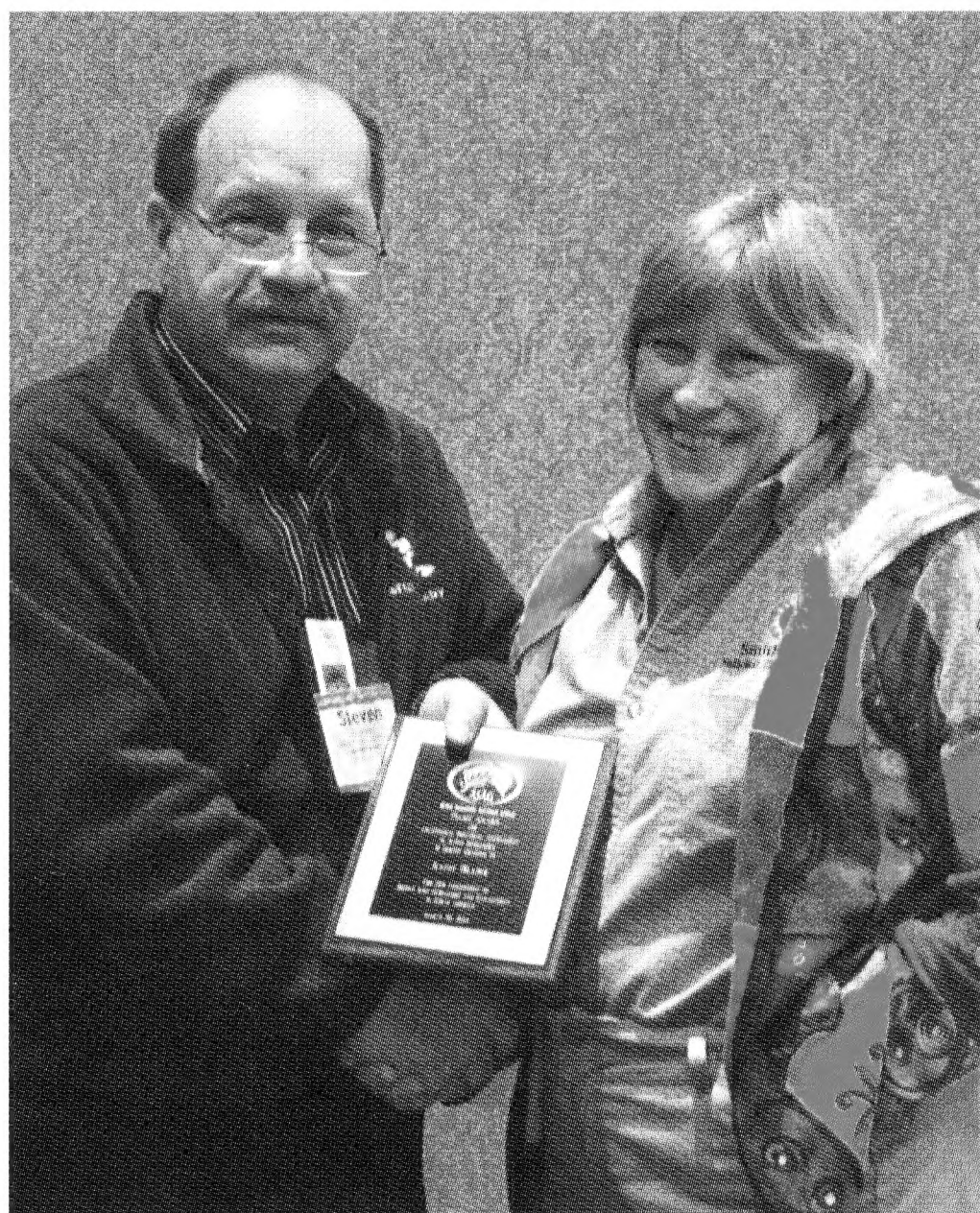


Guntur Leaves for Japan

Born at the Zoo in 2006, our male Sumatran tiger, Guntur, left the nest in late March. His new home, Zoorasia, is an excellent facility in Yokohoma. He made the 24-hour trip in a spacious, aluminum crate. His keeper, Leigh Pitsko, accompanied him all the way.

Guntur is unrelated to any tiger in Japan, and a young female at Zoorasia is unrelated to any North American tigers. That makes for an excellent genetic match, so staff at both zoos hope the two will one day become a breeding pair.

Staff and visitors at the Zoo will miss Guntur, but look forward to receiving a new breeding male from Zoo Atlanta later this year.



Honors for Zoo Staff

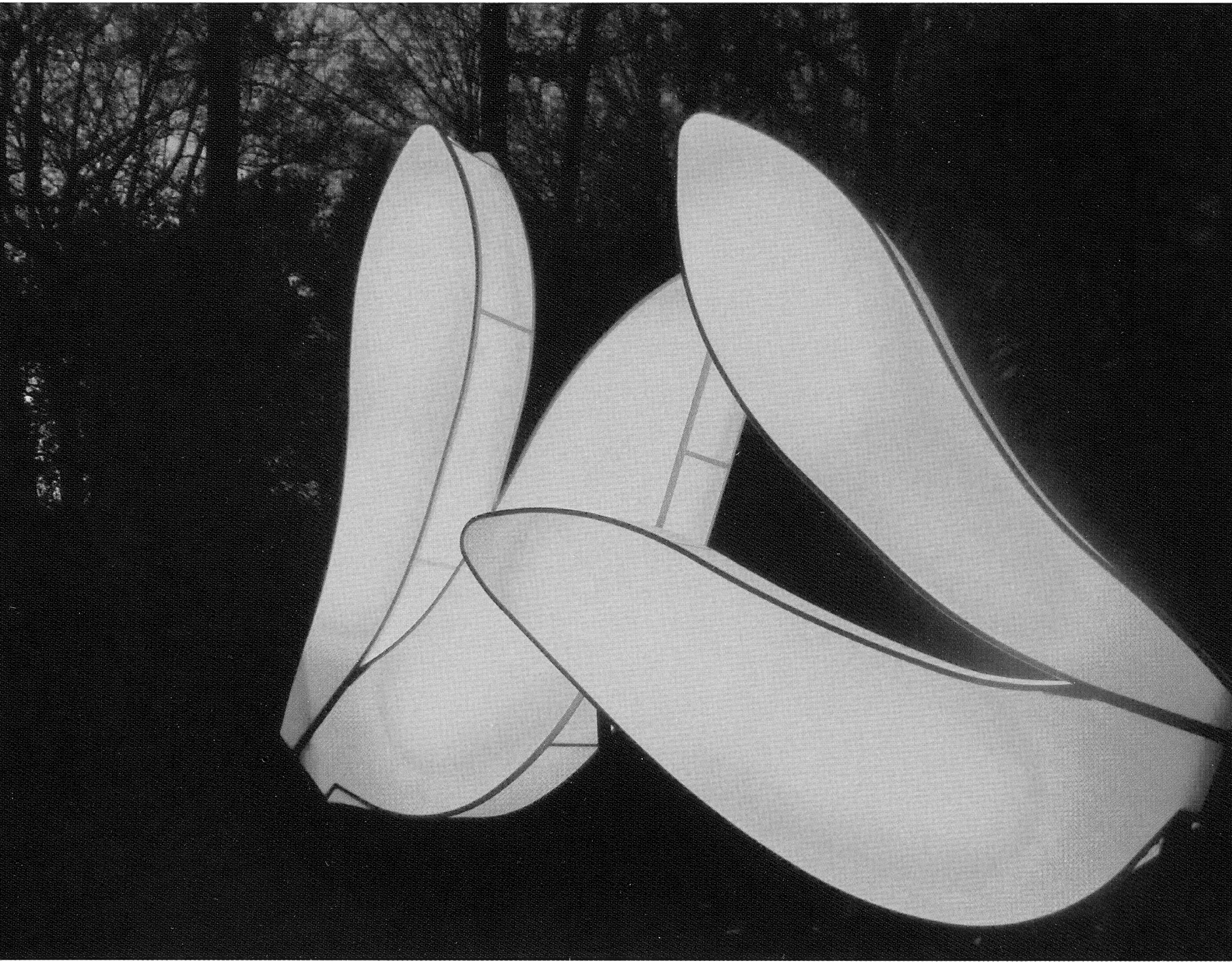
In March, the Association of Zoos and Aquariums bestowed a pair of Plume Awards for "significant achievement in avian husbandry" upon Zoo and Smithsonian Conservation Biology Institute staff. Warren Lynch, Chris Crowe, Lisa Ware, and Scott Derrickson were

honored for their work with white-naped cranes. Kathy Brader (far left) was lauded for her work with kiwis.

Sara Hallager (left), an expert on kori bustards, was invited to join the Bustard Specialist Group of the International Union for Conservation of Nature.



JESSIE COHEN/NZP



SMITHSONIAN'S NATIONAL ZOO

NEW ART: "LOVE MOTEL FOR INSECTS"

Zoo visitors entering through the Connecticut Avenue gate this spring and summer will encounter a striking new work of art: "The Love Motel for Insects." Designed by sculptor-biologist Brandon Ballengée, this temporary installation features a pair of giant dragonfly wings, illuminated at night by ultraviolet light. The artist's goal is to lure insects, many of which face declines due to habitat loss, to a safe space for breeding. "Love Motel" is one of 25 special installations placed throughout the city by the D.C. Commission on the Arts and Humanities.

Mark Your Calendar

- May 17 **ZooFari**
Support the Zoo while thrilling your palate with tempting morsels from D.C.'s finest restaurants. Learn more at fonz.org/zoofari.htm.
- May 31 **Kenn Kaufman Lecture**
Legendary ornithologist and gifted speaker, Kaufman reflects on his passion and signs books at the Zoo's Visitor Center. Learn more at fonz.org/birdclublecture.htm.
- Jul. 12 **Brew at the Zoo**
Support wildlife conservation by sampling local beers. Learn more at fonz.org/brew.htm.

FONZ Staff in Print

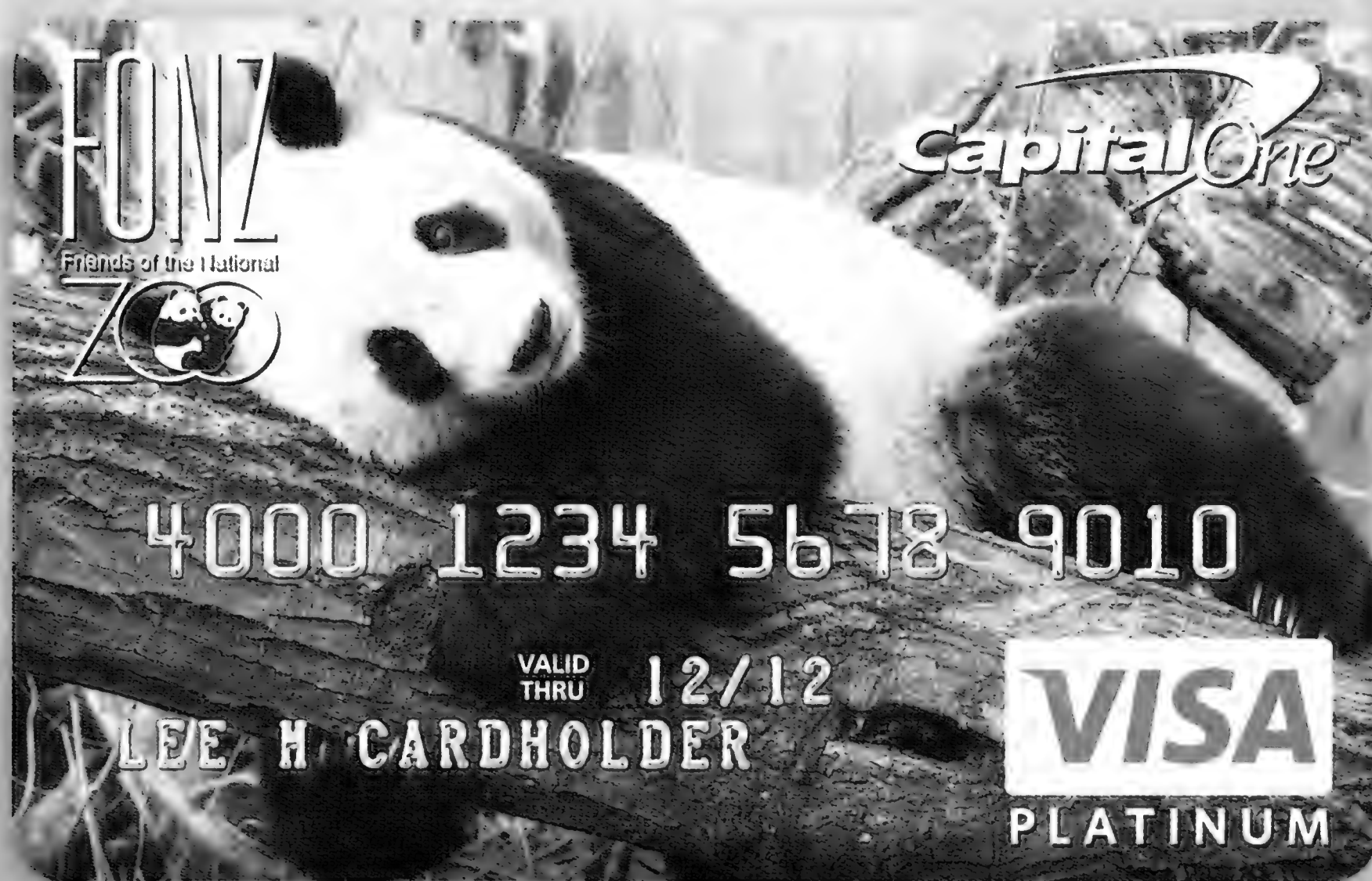
FONZ education program supervisors Caroline Winslow (left) and Lois Phoebus (right) contributed an article to the February issue of *Connect*, the magazine of the Association of Zoos and Aquariums. Their feature described the evolution of volunteering at the Smithsonian's National Zoo, from a casual enterprise run out of the back of a station wagon to a robust program with more than 1,500 volunteers. Each year, those volunteers contribute 100,000 hours of dedicated work, providing services worth three million dollars.



ALLIE KILLAM

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Salamander populations are plunging.

Zoo scientists in labs
and in the wild want to know **why.**

Salamander SECRETS

BY LINDSAY RENICK MAYER

It takes at least five people to catch North America's largest salamander—the hellbender. Two lift the large rock sheltering the amphibian. Two hold nets on either side of the rock. And one reaches through the murky water with bare hands to scoop the animal up before it darts away.

“You just feel this good squishiness and there’s nothing else like that in the world,” says Kim Terrell, a wildlife physiologist for the Zoo’s Smithsonian Conservation Biology Institute (SCBI). “They are insanely hard to hold onto. They feel like they’ve been dipped in Crisco, and they’re super strong and really fast swimmers. Sometimes at night, I’ll go to sleep, and I’ll just dream about the squish. It’s so good.”

Terrell is leading the Zoo’s efforts to study the effects of climate change on the hellbender, which is classified as near threatened. The third largest salamander in the world, it can grow up to 2.5 feet long and weigh up to 4.5 pounds. It is native to Appalachia.

Terrell’s fieldwork is complemented by the research that she’s conducting in the Zoo’s new salamander lab,

which doubles as an exhibit. Her study is one of half a dozen salamander-related projects at the Zoo, reflecting a growing focus on conserving one of the most diverse and rapidly disappearing classes of animals on the planet.

Old Dream, New Lab

Over the next hundred years, Appalachia is expected to see an overall temperature increase between 3 and 11 degrees Fahrenheit as the result of climate change. This could be bad news for animals that live in cold, fast-flowing water. The problem is bigger than just hell-

benders, though. NatureServe, a nonprofit conservation group that classifies species based on threats, estimates that at least eight species of Appalachian salamanders are at high risk of extinction.

Against that backdrop, Terrell will spend the next two years collaborating with state biologists, academic institutions, and other zoos to determine just how damaging the effects of climate change could be on hellbenders so that conservationists can determine the best methods for mitigating those threats.



BRIAN GRATWICKE/NZP

ABOVE: **Scientist Brian Gratwicke (red shirt) tests a hellbender salamander for the lethal chytrid fungus.**

FACING PAGE: **Red-backed salamander**



Scientist **Kimberly Terrell** holds a salamander in **Big Basin** Park, California.

Why Salamanders Matter

Salamanders play an important role in the food chain. Not only are they food to many predators, they feast on pests that can carry disease and become burdens to humans.

Zoo scientist Kimberly Terrell notes that salamanders also store nutrients in their bodies. Even though they're tiny, salamanders are so abundant and long-lived that these nutrients add up.

"In some forests you'll find more phosphorus in salamanders than in birds and small mammals combined. In this way they're kind of like a nutrient savings account for the forest," Terrell says. "Without them, the nutrients that sustain a forest would get flushed out. They add significantly to the stability of the forest."

Salamanders also serve as an important model for medical research, as they are the only vertebrates that can regenerate lost limbs. They can even regenerate eye and brain tissue.

To do so, she has designed an experiment that will look at how different kinds of temperature change affect hellbenders' ability to breathe and to fight off disease.

The first part of the work with the Zoo's 18 young eastern hellbenders (a subspecies) will focus on short-term temperature fluctuations like those the animals would experience over a week—or even in a few hours—in the wild. The second and longer-term part of the study will look at both seasonal changes alone and seasonal changes plus four degrees Fahrenheit to simulate a conservative estimate of predicted climate change.

Working with animal care staff and Suzan Murray, the Zoo's head veterinarian, Terrell will use blood samples to examine the animals' white blood cells, which can indicate their level of stress and suscepti-

BRIAN GRATWICK/NZP

bility to disease. She'll also measure their oxygen intake. Like all amphibians, hellbenders breathe through their skin. The wrinkles in their skin give them more surface area to take in oxygen from the water they live in. The warmer water is, the less oxygen it contains. Because oxygen drives metabolism and energy production, it's possible that global warming could stunt salamanders' growth.

All of this work is now on exhibit in a new salamander lab in the Zoo's Reptile Discovery Center (RDC), highlighting the collaborative efforts between the Zoo's animal care team and scientists. The salamander lab was the long-time vision of RDC curator Jim Murphy, who recognized in the late 1980s that rapid declines in amphibian populations indicated that something ominous was going on. Today visitors to the Zoo have a chance not only to see the hellbenders, but to interact with Terrell, other scientists, and the animal care team as they go about their work.

That connection between visitors and scientists is crucial, says senior curator Ed Bronikowski, who helped facilitate construction of the lab: "The single thing that distinguishes the National Zoo from all other zoos is our Smithsonian science. That is who we are; that is what we do."

Giants Among Us

Hellbenders—or "snot otters" as they are called in some parts of Appalachia—belong to the Cryptobranchidae, a family of amphibians that live in brooks and streams. The group includes the largest amphibians in the world: Chinese and Japanese giant salamanders. They grow up to six feet in length.

Although cryptobranchids have survived three mass extinctions in Earth's history, modern-day threats are causing their numbers to drop precipitously in both Asia and North America. Scientists fear that the salamanders may not survive an unprecedented array of threats, including climate change, habitat loss, pollution, disease, and the introduction of new predators. This was, in part, why the Zoo established, in 2010, the first breeding center for Japanese giant salamanders outside Japan.

Four Japanese giant salamanders live in the breeding center in RDC, while one is



MARK VAN BERGH PHOTOGRAPHY, MARKVANBERGH.COM

A hellbender in the Zoo's new salamander lab.

The single thing that distinguishes the National Zoo from all other zoos is our Smithsonian science. *That is who we are; that is what we do.*

on exhibit on Asia Trail. Animal care staff attempted unsuccessfully to breed the animals this year, but Bronikowski says they are likely still too young. The staff will try again this August when the breeding season starts up again.

In the meantime, the Zoo's Japanese giant salamanders are helping researchers understand one of the biggest threats to amphibians—a fungal disease called chytrid. Nearly a third of the world's more than 6,000 amphibian species are in danger of extinction, due in large part to chytrid. This could result in the worst extinction event since the time of the dinosaurs.

When the five Japanese giant salaman-

ders came to the Zoo in 2009, they tested positive for chytrid. Although chytrid has been deadly to frogs, it isn't lethal for Japanese giant salamanders. It appears to be akin to athlete's foot in humans. Murray was able to cure four of the salamanders of their chytrid. (She left the fungus on the fifth salamander so that scientists still have a sample for research.)

Cracking the Chytrid Code

Zoo geneticists are trying to discover why chytrid kills frogs but not Japanese giant salamanders. Researchers already know that the chytrid found on Japanese giant salamanders is slightly different from that

salamander **SECRETS**

found on frogs. They hope to begin to understand the difference by comparing the DNA sequences of various forms of the fungus. This research may also help scientists understand whether chytrid is a threat to hellbenders.

SCBI scientists have detected chytrid on amphibians in Appalachia, but the fungus is less prevalent than in the neotropics. The Zoo is working with chytrid specialist Karen Lips of the University of Maryland and National Museum of Natural History curator Roy McDiarmid to determine whether chytrid has already swept through the region, leaving animals that have developed a resistance to the fungus as a result.



BRIAN GRATWICKE/NZP

ABOVE: **Scientist Jennifer Sevin** holds a hellbender salamander.
BELOW: **Hellbender salamander.**



To determine if this is the case, the Zoo and its collaborators are looking back in time. They are studying nearly a thousand samples, collected in Appalachia during the 1950s through the 1980s. Scientists are examining the samples for chytrid DNA. “If chytrid did knock down Appalachian salamander species, we should expect to see no trace of chytrid up to a certain point and then a blast where there’s very high prevalence of infection and then a drop as the salamanders developed resistance or chytrid evolved into something less deadly,” says Rob Fleischer, head of SCBI’s Center for Conservation and Evolutionary Genetics. “When this work is complete, we hope to have a much better handle on what caused this massive decline.”

Mysteries of the Shenandoah

Hellbenders are not the only Appalachian salamanders on the Zoo’s agenda. Since 2007, Jennifer Sevin, a biodiversity conservation specialist for SCBI, has worked with state, federal, and academic institutions to monitor redback salamanders and endangered Shenandoah salamanders at more than 124 monitoring sites in Shenandoah National Park.

Sevin is looking at competition and hybridization between the two species and examining the characteristics of their sometimes overlapping habitats. She and her collaborators are exploring whether temperature and relative humidity help determine the very specific areas in which the animals live.

“The biggest mystery is what the salamanders are doing underground,” Sevin says. “Right now we don’t have a good explanation of why the Shenandoah salamander lives where it does. I’m hypothesizing that there’s something underground keeping it in those spots, but that’s probably going to be an ongoing mystery for a while.”

Sevin’s work also has a Zoo component. Last year, she and her U.S. Geological Survey collaborators looked at how redback and “leadback” salamanders in the Zoo’s climate chambers responded to temperature and humidity changes. (A “leadback” is a redback without the distinctive red stripe.) The next step in the research is to do the same experiment with Shenandoah salamanders.

The researchers hope their work has a practical impact. “Most people would assume that because it’s a national park, the salamanders are automatically protected,” Sevin says. “But there are activities that go on in a park, and management agencies have to make decisions all the time. I hope our research is used to help them make decisions to better protect these species.”

National Treasures

SCBI’s focus on Shenandoah salamanders and hellbenders is strategic, according to Brian Gratwicke, an amphibian conservation biologist. “Shenandoah salamanders are a natural fit because they’re a mountaintop endemic species that’s federally listed and only found in three mountaintops in the Shenandoah National Park,” he says. “Hellbenders really complement that approach because they’re restricted to larger mountain rivers. They represent the opposite end of the spectrum for Appalachian species, but we believe they are also affected by climate change.”

Cutting edge though it is, salamander research also brings the Zoo back to its roots: the conservation of North American wildlife. With Appalachia as the world’s hot spot for salamanders (see sidebar), Gratwicke says, “we need to learn all we can to protect them as a national treasure.” **SZ**

— LINDSAY RENICK MAYER *is a public affairs specialist for the Smithsonian’s National Zoo.*

Salamander Central

Stretching from southern New York to northwestern Mississippi, Appalachia is home to 77 salamander species—more than anywhere else on Earth. Between 1,000 and 4,000 salamanders can live in an acre of Appalachian forest. This means that you could find up to 1,000 salamanders in a patch of forest the size of a typical suburban backyard.

You may need to look quickly, though. In the 1990s, 38 Appalachian salamander species experienced declines of 50 percent or more, and additional Appalachian salamander species seem to be declining still. Scientists are trying to determine what happened and what is threatening them today.

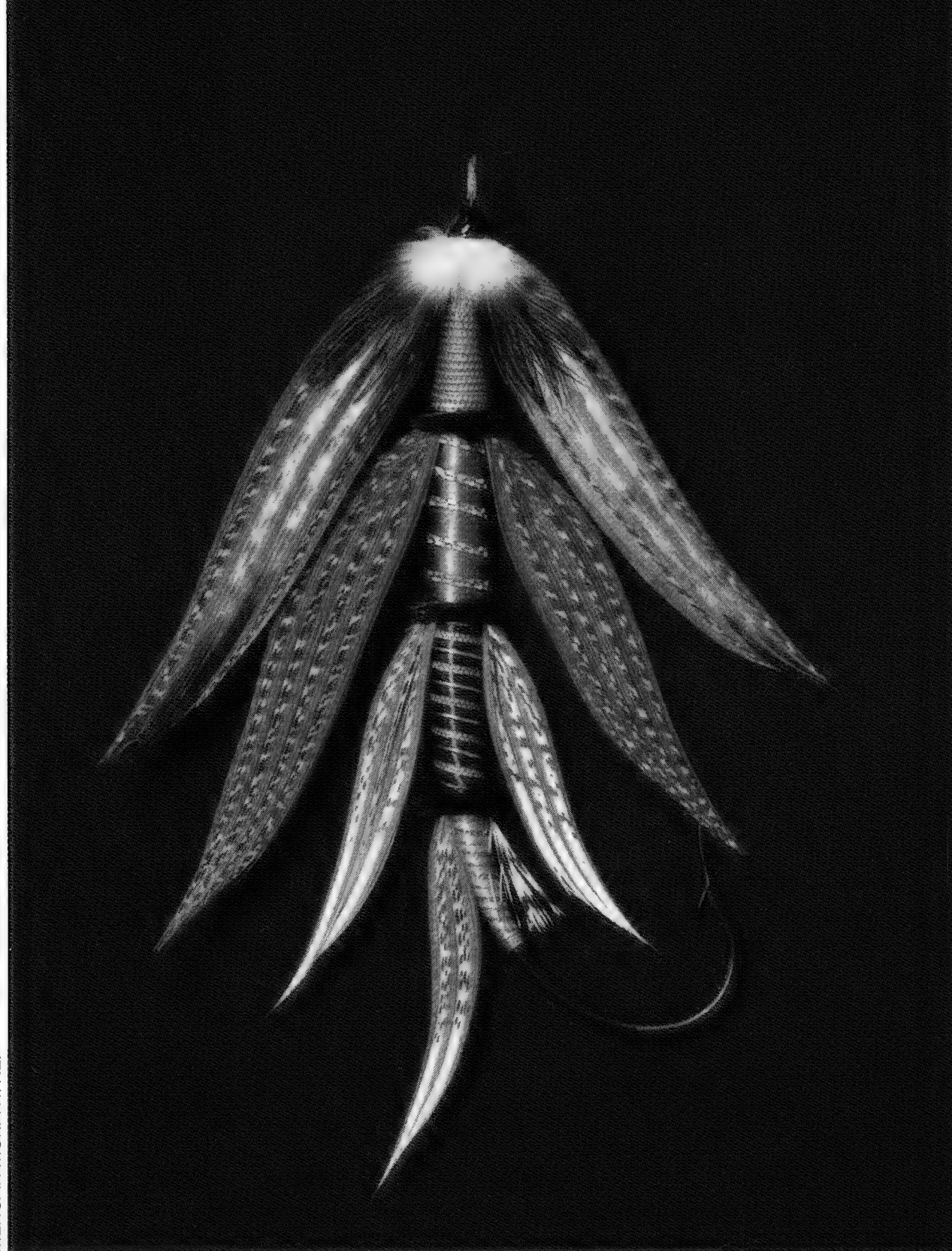
Zoo scientists are exploring this question both in labs and in the wild. Wildlife physiologist Kimberly Terrell works at both the Zoo's new salamander lab (see main article) and at sites throughout Appalachia.

"The idea is that in the lab we definitively say that this is the cause and effect of temperature on these animals," Terrell says. "We then take that knowledge and go into the field to see if the animals are stressed in the way we might expect them to be, given the results from the lab work. But we also look at other factors, such as water quality and heavy metal exposure. We want to see if these other environmental factors can worsen the effects of temperature."



Scientists from the Zoo and the Virginia Department of Game and Inland Fisheries search for hellbender salamanders.

MEGHAN MURPHY/NZP



Feathers OF A BIRD

BY BRITTANY STEFF

**At the Smithsonian's National Zoo, even the birds recycle.
And what does a bird recycle?
The only thing it really has—its feathers.**

Feathers are no meager assets.

They are truly tantalizing treasures, tangible links to the past. That's because feathers are actually modified dinosaur scales. Birds themselves are living dinosaurs, the descendants of small, carnivorous reptiles. (Think very small versions of *Jurassic Park's* velociraptors). More than 150 million years ago, fossils show, those small dinosaurs began sporting feathers. The feathers' purpose is unknown. Perhaps they helped the animals make short, gliding flights. They may have provided insulation or attracted mates. Scientists aren't sure.



Feathers OF A BIRD



The male Raggiana bird of paradise, native to New Guinea, is famous for its tail feathers, which it uses in courtship displays.

What scientists are sure of is that feathers have attracted and intrigued humans for millennia. Modern birds use feathers to fly, of course, and also to keep warm. We humans haven't yet figured out how to co-opt feathers for flight, though we're more than eager to snuggle under a down comforter. Birds also use their feathers to attract mates, and they are very successful in doing so. Their brilliant hues have also attracted non-avian bipeds—humans—often to the birds' own detriment.

In some cases, humans have literally loved birds to death for the sake of their feathers. Many of America's birds, including herons and egrets, and much of the world's most breathtaking avifauna (including the sublime birds of paradise) were hunted to near-extinction to adorn ladies' hats at the turn of the last century. Because of this fashion, protecting birds often means protecting their feathers. If owning, transporting, or using feathers is illegal, the birds that grow the feathers are usually much safer.

Kiwi Cloaks

Some cultures, however, hold feathers as sacred and use them in religious and tribal ceremonies. Laws often contain special provisions providing for such uses. For instance, in the United States, the Bald and Golden Eagle Protection Act makes it illegal to own or collect eagle feathers, except for Native Americans with the proper permits.

The Maori people of New Zealand are in a similar situation. They weave ceremonial cloaks out of feathers, and the soft brown feathers of the kiwi are very highly prized. Kiwi feather cloaks are given names and passed down for generations. Some are several centuries old. The Department of Anthropology at the Smithsonian's National Museum of Natural History has two, donated in 1927 and 1962.

The tradition of cloak-making comes from a time, several centuries ago, when there were many more kiwis, and birds overall, in New Zealand. Originally, there were only a handful of mammalian species in New Zealand, all of them bats. With the arrival of invasive terrestrial carnivores, including cats, dogs, and ferrets, kiwi populations plummeted. The new predators

JESSIE COHEN/NZP

flummoxed kiwis and the dozens of other flightless bird species on the islands. Birds were completely unequipped to protect themselves, their eggs, or their hatchlings from harm.

New Zealanders, who feel about kiwis the way Americans do about bald eagles, stepped in to save the iconic birds. Not surprisingly, kiwi conservation and breeding take place predominantly in New Zealand. However, thanks to one passionate and persistent keeper, kiwi conservation is spreading around the world. The National Zoo's Kathy Brader oversees all kiwi breeding outside of New Zealand. The first such hatching took place at the Zoo in 1975. Since then, seven more kiwis—four males, three females—have hatched at the Zoo, and Brader's been there for most of them.

Brader also started the Zoo's "Meet a Kiwi" program, the only chance most people will ever get to interact with one of these nocturnal birds. It takes place on Mondays, Wednesdays, and Fridays at 11 a.m. The star of the show is generally Manaia, a very laid-back male who hatched here in 2006.

The Zoo works closely with the New Zealand Embassy, which takes a proprietary interest in the kiwis. One day in 2011, a visitor from the embassy brought his family to visit Manaia and talk to Brader. As everyone was chatting after the kiwi meet-and-greet, Brader noticed one of the men walking around, picking kiwi feathers up off the carpet. Manaia was molting, so there were plenty to go around. Curious, Brader asked the man what he was doing.

It turns out that the gentleman—the father of an embassy staffer—is a retired policeman from New Zealand. In his spare time, he is learning to weave kiwi feather cloaks. The weaving of these cloaks is a dying art. New Zealand needs weavers both to create new cloaks and repair old ones. Weavers, in turn, need feathers to work with.

Flying Kiwis

Feathers are an endlessly renewable resource. Our kiwis, and in fact all our birds, busily produce them every day, turning bird food into keratin—the same substance that makes up your fingernails and hair. When feathers fall off, they get swept up and tossed out, along with used nesting



JESSIE COHEN/NZP



JESSIE COHEN/NZP

material, uneaten food, and bird droppings. If someone wanted them, Brader was more than happy to oblige.

She worked with the New Zealand Embassy and the New Zealand Department of Conservation to get the proper export and import permissions to send regular shipments of kiwi feathers to New Zealand.

TOP: Bird keeper Kathy Brader chats with a visitor at a "Meet a Kiwi" presentation.

ABOVE: The Zoo was the first institution outside New Zealand to breed kiwis.

Feathers OF A BIRD



Biologist Sara Hallager tends a kori bustard.

The whole process is called, rather poetically, “feather repatriation.”

On October 1, 2011, the Zoo sent its first shipment of kiwi feathers to New Zealand. Flying directly to Auckland in their own reserved seat (and in notional possession of a boarding pass labeled “Feathers, Kiwi”), the feathers arrived in the middle of the 2011 Rugby World Cup. Maori officials met them at the airport and took them through customs, where they were, of course, directed to the “New Zealand Residents” lane for processing. Afterward, they were blessed by the Maori and moved into storage before being carefully cleaned and woven into cloaks. As cloaks are woven or repaired, photos of those containing National Zoo feathers will be sent to Brader.

Kiwi cloaks are made to last, so feathers from Zoo kiwis will be part of cultural treasures cherished hundreds of years into the future. Brader explains, “This is a way of immortalizing our birds. It offers a means of involving them directly in conservation and cultural recovery efforts, and it takes very little work on everyone’s part. It’s a classic win-win situation.”

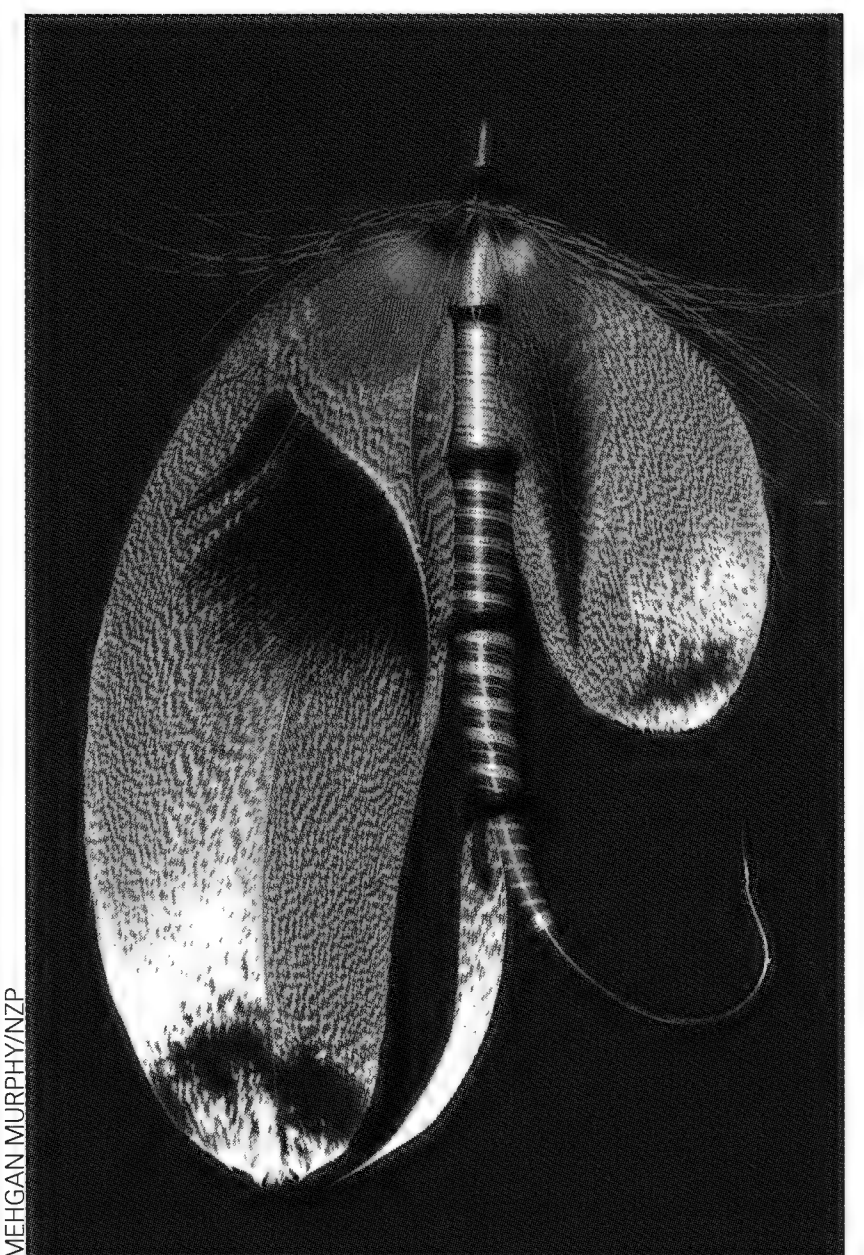
Kiwis aren’t the only birds donating their feathers to a higher cause. We send all our bald eagle feathers to the National Eagle Repository, where American Indians can apply for permits to receive them.

Costly Commodity

Some members of the human species use feathers to lure and beguile creatures of another order entirely—fish. For centuries, devoted fly fishermen have used feathers to create fishing flies, and they vastly prefer real feathers to synthetic ones. Prized almost beyond all other feathers are those from bustards, a family of large birds. Kori bustards, which you can see at the Bird House, are the heaviest birds that can fly.

According to Bird House biologist Sara Hallager, “Using bustard feathers in flies goes back several hundred years. I’ve been told that their feathers marry really well with other types of feathers.”

Long ago, English fishermen used great bustard feathers for flies. But the great bustard went extinct in the United Kingdom in



MEHGAN MURPHY/NZP

the 1840s. It still persists in remote pockets throughout Europe and Asia, but those populations are not nearly as convenient to Western fly fishermen.

Just because the great bustard supply dried up does not mean the demand for its feathers did. For a while, Hallager says, fly fishermen made do by buying and plucking museum specimens. As the supply of even these dead bustards dwindled, the price for bustard feathers skyrocketed, eventually reaching a reported \$500 for a single kori bustard feather.

Great bustards and kori bustards are similar in size, and their feathers are alike. So kori bustard feathers were a natural replacement for great bustard feathers in flies. Although kori bustards are not considered endangered, scientists do believe their numbers are falling due to habitat loss and illegal hunting in eastern and southern Africa, where they live. Kori bustards also breed extremely slowly, creating further difficulty for populations.

Feathers for Fishermen

Hallager is in charge of the Association of Zoos and Aquariums’ Species Survival Plan (SSP) for kori bustards. This means she coordinates all bustard breeding and advises zoos on research and conservation.



MEHGAN MURPHY/NZP

LEFT AND ABOVE: These fishing flies contain kori bustard feathers.

So it was Hallager who got the call when a fly-tier (one who creates flies for fly-fishing) from Michigan decided that something needed to be done to help kori bustards. Together, they decided to flood the market with free kori bustard feathers, which keepers could collect by the bagful, given that the birds molt twice a year.

As SSP coordinator, Hallager coordinates feather collection all around the country. Keepers at zoos that participate in the kori bustard SSP collect naturally molted feathers, bag them up, and send them to John McLain, the fly-tier from Michigan (who, coincidentally, is another retired police officer). McLain cleans the feathers, sorts them, and sends them free of charge to fly-tiers all around the United States. (Because of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, kori bustard feathers cannot be sent outside the United States.)

The National Zoo's own kori bustards contribute to this program, furthering the Zoo's conservation mission. Hallager, who is doing a long-term study on molting, has so far picked up more than 4,000 feathers. They are catalogued and then sent to McLain.

The fly-tiers who benefit from the program, now five years old, are encouraged to donate back to the kori bustard SSP. So far, the fly-tiers have donated funds for hormonal research on kori bustards, for video cameras for every zoo that houses the birds (the video will be used to create a visual husbandry manual), and for a satellite monitor for a scientist studying kori bustards in Botswana.

"Is it saving the koris in Africa?" Hallager asks. "Probably not. But it's helping. And it really has made a difference."

In a very concrete way, the birds themselves contribute to the conservation of other birds. After all, birds of a feather flock together. And so, it turns out, do feathers. **SZ**

— BRITTANY STEFF *is a senior web editor and science writer for Friends of the National Zoo.*



Since 1997, the Zoo has hatched more than 50 kori bustards. Many of them have gone on to breed at other zoos.

“**W**hat’s the scariest animal in the forest?” Researcher Kate Jenks posed that question to a group of rangers in Thailand’s Khao Yai National Park. Their prompt response: the dhole. Also known as the Asiatic wild dog, this elusive, endangered canid lives in packs throughout South and Southeast Asia.

About the size of a border collie, the dhole usually sports a reddish coat and a bushy tail. Very social, it communicates with other pack members by whistling. “It’s not like a howl,” explains canid biologist Nucharin Songsasen of the Smithsonian Conservation Biology Institute (SCBI). “It’s more melodic, like a whistle.” This vocalization earned dholes the nickname of “whistling hunters.”

DOGGING THE dhole

BY ALLIE KILLAM

Little known and widely feared,

Like African wild dogs, dholes hunt quickly and efficiently, teaming up to take down deer, ibex, mountain sheep, wild pigs, and other prey. They tear rapidly into their meal, sometimes feasting while the victim is still alive.

Only about 2,500 dholes survive in the wild. Given their secretive nature and a relative lack of field research, it’s incredibly difficult to pinpoint the animals’ where-

MARK BOWLER/NATURE PICTURE LIBRARY



the Asiatic wild dog has few fans.
But they include dedicated Smithsonian scientists.

DOGGING THE **dhole**

Data from Jenks's dhole
showed that the dhole
(and likely its pack) stayed
within the protected area of
the wildlife sanctuary.

**Contrary to villagers'
fears, the wild dogs
were not venturing into
human communities and
stealing chickens.**

abouts. Dholes have vanished from some places where they were seen 30 years ago, and the International Union for Conservation of Nature (IUCN) estimates that their numbers are declining.

An Unpopular Animal

As a research assistant in the Geographic Information Systems (GIS) lab at SCBI, Jenks first learned about dholes during a 2004 trip to Thailand, where she went to study clouded leopard distribution. She spent her days setting up camera traps in Khao Yai, where rangers told her about the wild dogs.

The whistling hunters fascinated Jenks, and they became her research focus as a graduate student at the University of Massachusetts. She moved to Thailand in 2005 to study them in depth.

One of the first things Jenks learned is that dholes are not popular. Many locals, she found, would agree with what naturalist E.G. Phythian-Adams wrote in *Jungle Memories* in 1949: "Except for his handsome appearance, the wild dog has not a single redeeming feature, and no effort, fair or foul, should be spared to destroy these pests of the jungle."

Dholes, it turns out, are blamed for hunting domestic fowl. "They're often made the bad guy," says Songsasen. "Nobody cares about the little red dog." In fact, officials in Thailand complain of dhole "overpopulation" and have sought to control their numbers.

"Well, wait a minute," thought Songsasen, who is also coordinator of the IUCN's Dhole Working Group. "Those animals are listed as endangered. We don't really know exactly how many of them there are in Thailand." But, she explains, conservationists can't effectively combat overpopulation claims without scientific evidence.

Compiling that evidence is a key task for the working group. Researchers are gathering existing knowledge about dhole distribution and trying to assess the species' status throughout its range. "International collaboration is essential," says Songsasen. "Thailand is not unique. Dholes are regarded as pest species in other countries as well."

The whistling hunter also gets blamed for depleting the tiger prey base. But Jenks

thinks that's a bad rap. "There haven't been tigers in the park for years because of poaching," she explains. "Like the wolves here, dholes get blamed. People don't really know the impact they're having."

Picturing a Predator

Given those gaps in scientists' understanding of dholes, Jenks's mission for her Thailand research was to learn more about the animal's distribution in its range. Did the range overlap with tiger territory? And what was the wild dog's prey base? A deeper



AXEL GOMILLE/NATURE PICTURE LIBRARY

understanding of dhole populations was essential for protecting this endangered animal. Jenks worked collaboratively with Songsasen, Peter Leimgruber, and other SCBI scientists, as well as partners at the Thailand Department of National Parks, Wildlife and Plant Conservation, Kasetsart University, and the Zoological Park Organization.

Jenks's first task upon moving to Thailand was to begin the slow process of obtaining permits to capture dholes and put radio collars on them. Before they could do

that, however, researchers first had to find the animals. To do so, Jenks backpacked through the Khao Ang Rue Nai Wildlife Sanctuary, setting up camera traps. The cameras would show where dholes were located within the sanctuary.

That was the plan, anyway. However, the few camera traps Jenks and her collaborators could afford to begin with were quickly destroyed by very curious elephants. The team's proposed solution to that problem was to hide the cameras in metal boxes. That sounded simple, but it wasn't.

"In Thailand," Jenks recalls, "it turned into a big scavenger hunt to find a shop to create it, to find the metal. We ended up making metal boxes and bolting them to the trees so the elephants can't knock them off. It's one of those fun things that happen in the field and you don't plan for."

Two years passed as the cameras shot photos of dholes, clouded leopards, ungulates—and elephants, of course. Because dholes live in packs of roughly 20 members, it was initially difficult to distinguish by photo which dhole belonged to which pack.



A pack of dholes in India feeds on a spotted deer.

DOGGING THE **dhole**

Luckily, one female had no color in its tail. That helped the researchers determine that all the dholes in the park belonged to the same pack.

Emails From the Wild

In January 2008, the research team received its long-awaited permits for capturing dholes. Jenks and company set the traps eagerly and waited. And waited. And waited. Dholes, it turned out, were too smart to get caught, no matter how attractive the bait.

Finally, in January 2011, one dhole was captured, anesthetized, and collared. “They’re quite unique when you see the real

thing,” says Songsasen. “Before he went to sleep, he made these amazing vocalizations. We were all standing there having goose bumps. We think he communicated with his pack members.”

The GPS transmitter within the collar collects information on dhole movement constantly, but doesn’t transmit until the pack comes within range of a cell phone tower. All the information collected since the previous transmission is then sent via email and text message. Jenks laughs and says although she is now back in the States, it’s a welcome surprise when her dhole emails her.

When Jenks does hear from her dhole, she shares the data with SCBI’s Peter Leimgruber, who has successfully used radio collars to track numerous species around the world. He is particularly interested in how endangered species interact with their environments. He explains, “The biggest threat to biodiversity is habitat loss. Where do the species live, and how is that affected by human life?”

Data from Jenks’s dhole showed that it (and likely its pack) stayed within the protected area of the wildlife sanctuary. Contrary to villagers’ fears, the wild dogs were not venturing into human communities and stealing chickens. The culprits may have been jackals, feral forest dogs, or even loose domestic dogs. Nailing down exactly what’s happening would require additional research.

Related Research

While Jenks’s fieldwork focused on Khao Ang Rue Nai Wildlife Sanctuary, she also sought to understand what was happening in other dhole habitats. She collaborated with staff from other parks and sanctuaries that had camera traps. They shared their images with Jenks.

Jenks also conducted several hundred interviews with people living close to protected areas in southeastern Thailand. She asked what they knew about wildlife, and learned their attitudes regarding certain species. The most surprising result of the study was the inability of locals to identify a dhole via photograph. Only 20 percent of nearly 800 interviewees correctly identified a dhole. The rest couldn’t distinguish

Field assistant LungDaeng, veterinarian Luis Padilla, and scientists Kate Jenks and Nucharin Songsasen savor the triumph of finally collaring a dhole, in 2011.



NUCHARIN SONGSASEN/NZP

between dholes and jackals or feral forest dogs. This, Jenks thinks, may help explain why dholes get blamed for all negative experiences with wild canids.

The inability to differentiate between species inspired hope in Jenks that one day there could be an educational effort that will better inform Thai residents about their wild neighbors. Being the only American in the area, Jenks was often the object of curiosity, but she believed that being watched was worth the positive attention it brought to the dhole, proving it an animal worth studying. “Here’s this foreigner coming to work on this,” villagers seemed to think. “Maybe we should pay more attention.”

Her most rewarding experiences were the small interactions she had with the people in the market. “They would ask about what I was doing,” she says. “Those people would never have any contact with scientists in conservation research, and it was neat to touch them. People would get excited to see the different photos.”

As a complement to her fieldwork, Jenks collaborated with a Thai veterinary school to collar 20 domestic dogs. The collars recorded two weeks’ worth of movement. Once the information from the collars is analyzed and mapped, researchers will have a clearer picture of whether domestic dogs roam within the range of the dhole pack that Jenks studied.

Initial Answers

As happens often in science, Jenks’s research raised more questions than answers. Upon completion of her Ph.D., she returned to the United States. Leaving her fieldwork in Thailand was wrenching. “I feel like it’s just the beginning,” she explains. It took years to accomplish the collaring of one dhole, but further field research must await funding.

Still, the team has begun to draw some preliminary conclusions. “From the little data that we have, this species only lives in protected land,” explains Songsasen. Protected land areas are often surrounded by development, causing habitat loss and concern for genetic diversity. Songsasen hopes that the next phase of field research can include a focus on the threat of inbreeding, since dholes are concentrated in protected areas.

The team also has a clearer picture of

the significance of dholes within their ecosystem. “They’re becoming even more important,” says Jenks, “because of the disappearance of tigers and leopards, which are being poached out. Lots of protected areas in Thailand are without the big predators, so the dholes become the only ones who can take down prey species.” Despite their unfavorable reputation, the wild dogs are actually keeping the ecosystem in balance.

Changing the dhole’s reputation will take time and education. Jenks’s interviews revealed a range of varying attitudes. Seventy-seven percent of respondents agreed that dholes should be protected. Yet the closer respondents lived to a protected area, the more likely they were to view dholes as dangerous.

Songsasen hopes SCBI’s work will inspire a greater appreciation of the whistling hunter. “Our research has stimulated others in Thailand to study dholes,” she says, “so this will eventually raise the profile of the species, I hope.”

Meanwhile, the radio-collared dhole still wanders the forest with its pack, transmitting data on the wild dogs’ movements. And camera traps still snare images of these elusive animals. Each piece of new information equips scientists to better understand—and protect—this Asian wildlife wonder. 

—ALLIE KILLAM *is a Smithsonian Zoogoer intern.*



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Zoogoer kids CORNER

BEAST BITS

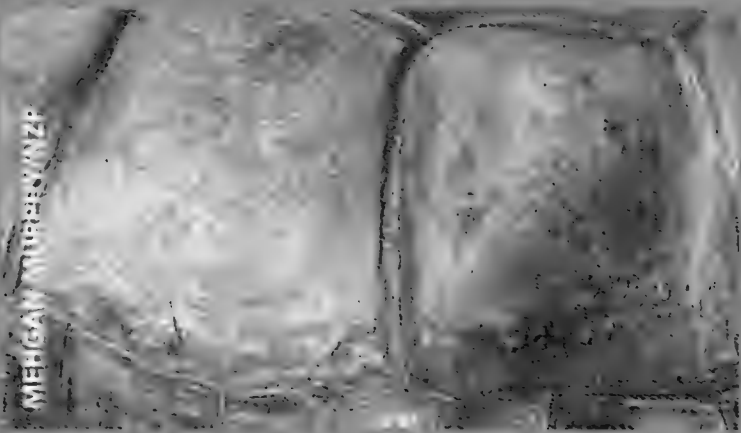


Fishy Felines

House cats are not famous for their love of water. But their wild relatives, fishing cats, dive in without a second thought. A fishing cat perches by the water's edge and lazily draws its webbed paws across the surface. That attracts fish, which come looking for tasty insects to eat. Bad move. The cat plunges in and, if lucky, snatches a fish for dinner. **You can see fishing cats on Asia Trail.**

Zoo Clue

This shell belongs to one of the oldest animals at the Zoo. What is it? Find out at nationalzoo.si.edu/goto/zooclue.



Kangaroo Cousin

Tammar wallabies look like miniature kangaroos. Like kangaroos, wallabies carry their babies in pouches. But they are much smaller, weighing only 15 to 20 pounds. Both wallabies and kangaroos belong to the Macropodidae family. That name means "big feet." And wallabies do indeed have big feet, which help them leap like kangaroos. **You can see a tammar wallaby in the emu yard on Olmsted Walk.**



Park Protector

Did you know that the Smithsonian's National Zoo has its own police force? That's how seriously we take visitor safety. Meet one of the folks who work to protect the park.

OFFICER FRANK SIMMONS

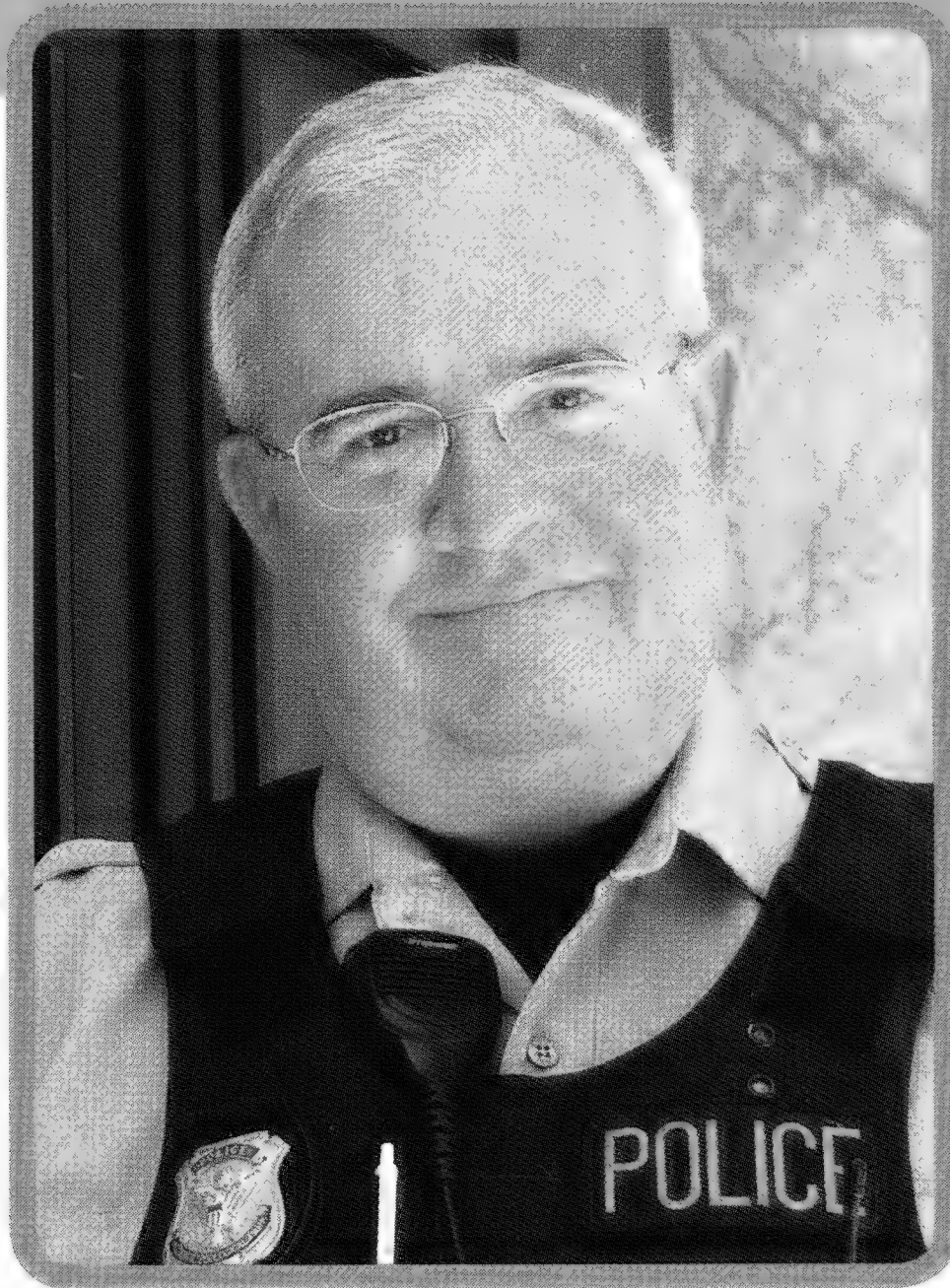
spent many years keeping the streets of Baltimore safe before he began working at the Smithsonian. Each officer at the Zoo; he says, has "extensive background in urban policing." That training helps Zoo police officers deal with the thousands of visitors who arrive at the park each day.

Officer Simmons first worked at the Smithsonian Environmental Research Center in Maryland before coming to the National Zoo in 2011. His favorite part of working at the Zoo is the people. "Because the Zoo is always open to the public, and free, you meet all different kinds of people, and that's what makes it so nice," he says.

His day begins with a briefing so that all the officers in the park are aware of any activities going on. Some days, Officer

Simmons might be assigned to a certain location, or he may be on foot patrol. Part of his job includes helping visitors and working with crowds, but he also has to be prepared for the unexpected.

Zoo police officers practice emergency drills and procedures on a regular basis. For example, the police are trained to take action should an animal escape. They know how to secure gates, usher visitors to shelter, and deal with the animals (both Zoo residents and wildlife).



ALLIE KILLAM

A Helping Hand

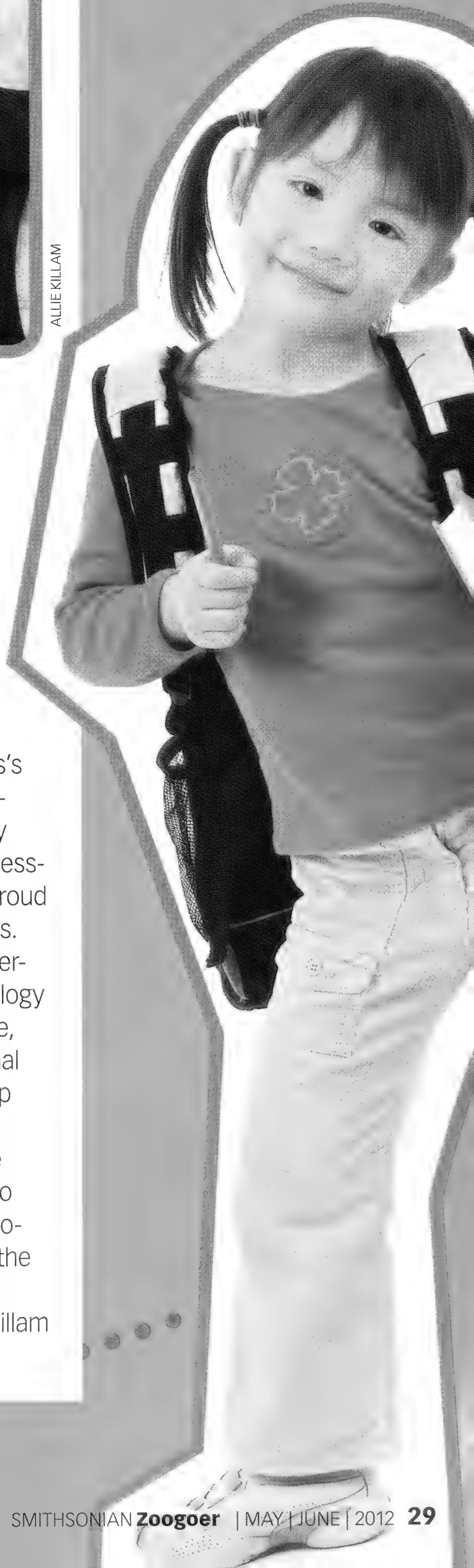
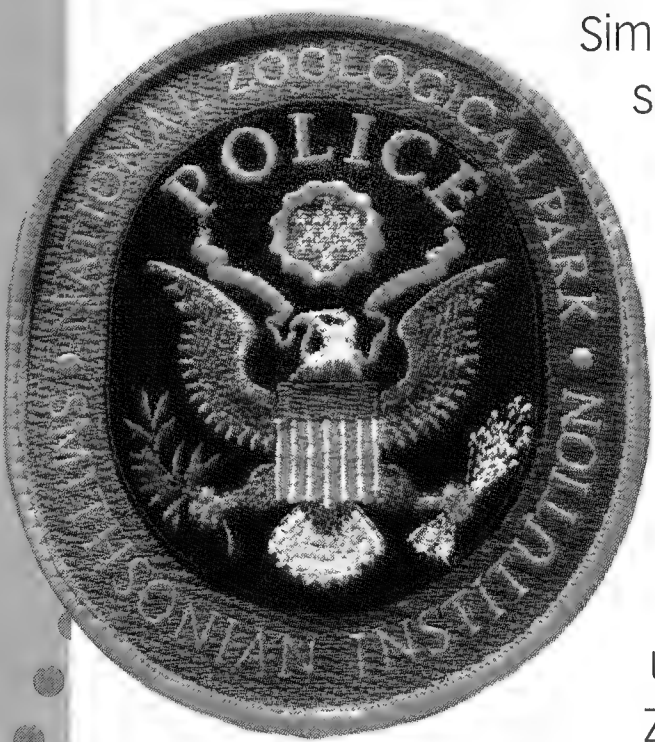
Luckily, animal crises almost never arise. Most of the time, Officer Simmons answers questions and gives directions. "It's a helping profession," he explains. "We will help lost children or deal with injuries and medical problems." If need be, he summons help from the Zoo's nurses and paramedics.

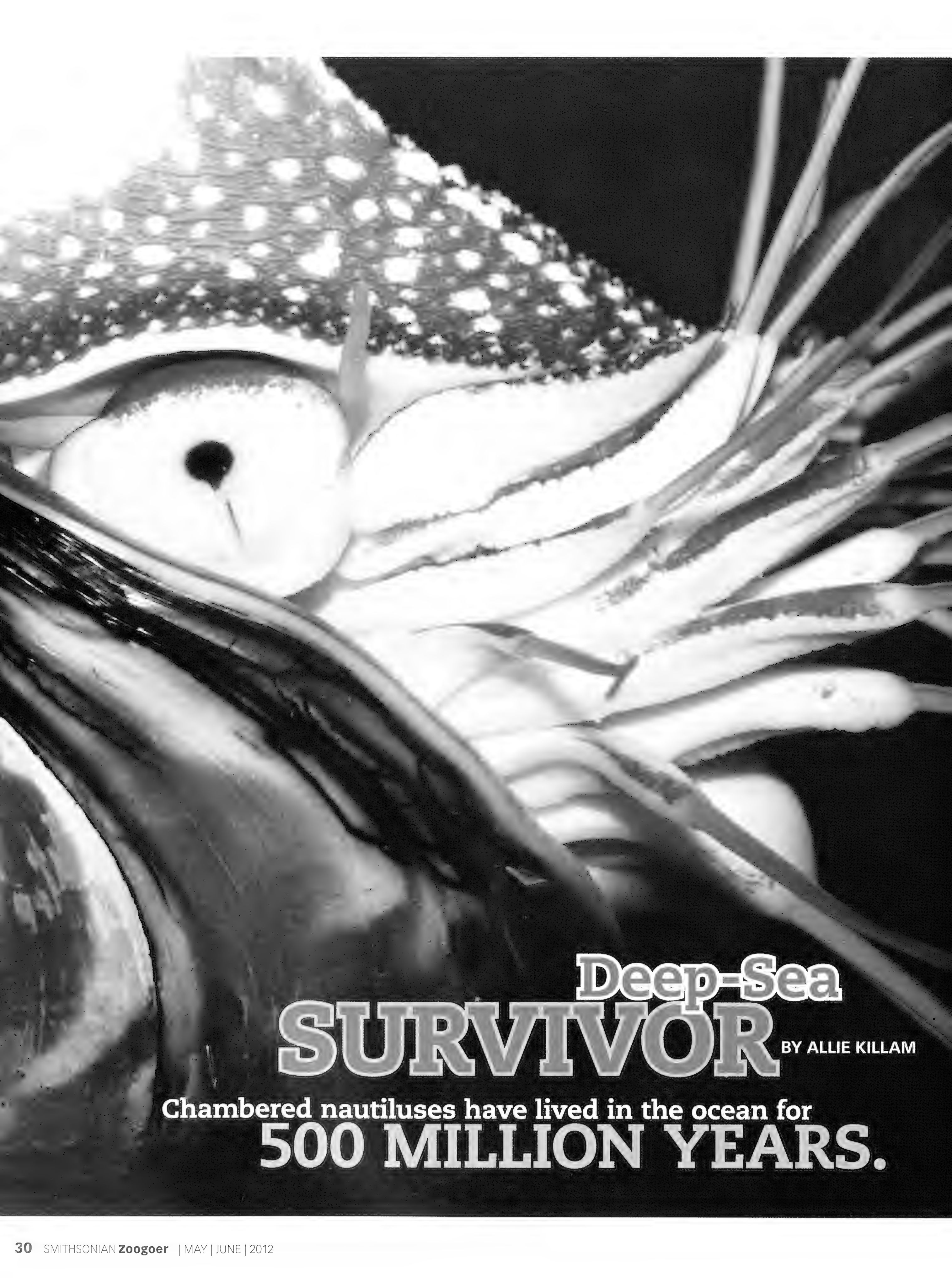
The most difficult part of Officer Simmons's work is when a child has an accident. Fortunately, that is rare. His job is to help turn any bad situations around, and he does so successfully. "I'm proud of my profession, and I'm proud of the men and women I work with," he says.

When he's not describing the Zoo's partnership with the Smithsonian Conservation Biology Institute or explaining where the animals are, Officer Simmons enjoys speaking with animal keepers. "I ask them questions so I can keep the public informed," he explains.

Whatever surprises may occur during the day, Officer Simmons and the rest of the Zoo police force are prepared. "We're here to protect the visitors, the staff, the animals, and the park," says Simmons.

— Allie Killam





Deep-Sea **SURVIVOR** BY ALLIE KILLAM

Chambered nautilus have lived in the ocean for
500 MILLION YEARS.

Living FOSSIL

Millions of years before the first dinosaurs, strange-looking creatures called chambered nautilus glided through the sea. They're still around long after the last dinosaur died off. In all that time, chambered nautilus haven't changed much. So people sometimes refer to them as "living fossils."

Mobile HOME

One secret to the chambered nautilus's survival is its shell. It's made of a tough material that few other sea creatures can bite through. When the nautilus feels threatened, it can pull its whole body into the shell and wait. Different chambers, or rooms, make up the shell. As the animal outgrows one chamber, it builds a newer, larger one.

LOCATION, LOCATION, LOCATION

Chambered nautilus love cool water. During the day they glide anywhere from 900 to 2,000 feet below the surface. Few other creatures live at those depths, however. To find food, the nautilus must rise to more shallow water (300 to 500 feet deep). It does so at night, when the water is cooler and fewer predators are around. Chambered nautilus live in the Pacific and Indian Oceans, usually near coral reefs.

CREATURE FEATURE

Supper time SAFETY

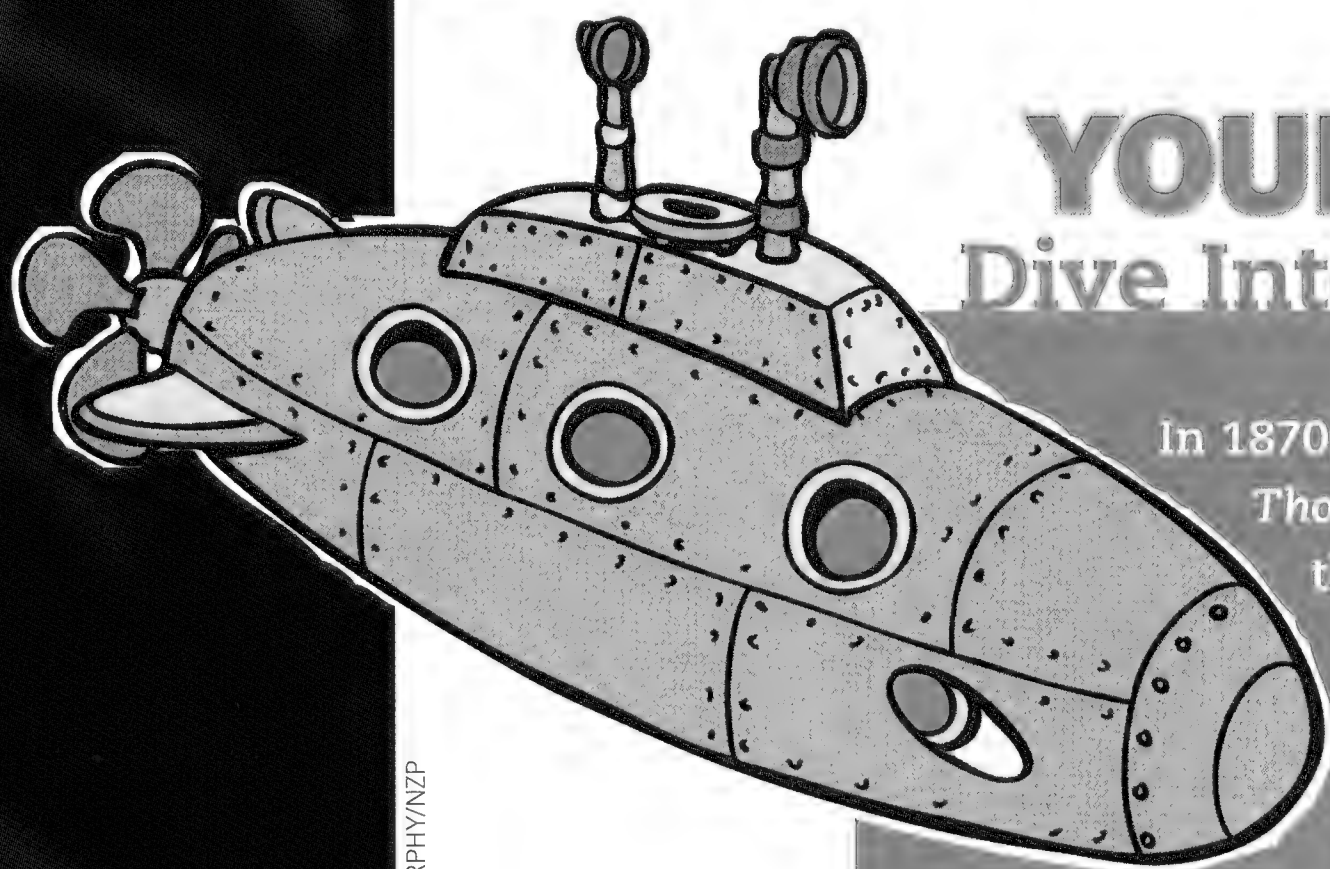
These invertebrates have poor eyesight, so they find prey by smell. At the Zoo, few things excite a chambered nautilus like the smell of shrimp. When a keeper lowers a shrimp into the nautilus tank, the nautilus swiftly uses its tentacles to sweep the shrimp into its mouth. The keeper has to be very careful while hand-feeding the chambered nautilus, because it has a very sharp beak.

SECRETS in the Sea

Living at great depths, chambered nautilus are hard to study in the wild. Scientists don't know, for example, how long the animals live. (In zoos, they have made it to 17.) Scientists also wish they knew more about chambered nautilus reproduction. No one has ever seen nautilus eggs in the wild. Chambered nautilus rarely breed in zoos. One did lay eggs once at the National Zoo, but they didn't hatch.

At the ZOO

Dive into the Invertebrate Exhibit to see chambered nautilus.



MEGHAN MURPHY/NZP

YOUR TURN Dive Into the Imagination

In 1870, French author Jules Verne published *Twenty Thousand Leagues Under the Sea*. The novel follows the adventures of a submarine called the *Nautilus*. Do you think *Nautilus* is a good name for a submarine? Why or why not? If you had a submarine, what would you call it? And where would you go exploring? Share your thoughts with us at zoogoer@si.edu.

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Comments? Questions?

Please email us at
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fonz.org/join.htm

FONZ Board Nominations

At this time of year, Friends of the National Zoo normally seeks candidates for the FONZ Board. This year, however, is different. The Board has grown to 25 members, eight of whom have indicated a desire to seek reelection. So the Board is not seeking new nominees for 2013. A list of the Board members standing for reelection will be published in the July-August issue of *Smithsonian Zoogoer*. Members can write in candidates at the time of the election.

RESTAURANT POINTER

ZooFari Restaurants

Looking for a place to eat? Consider patronizing one of the fine restaurants that supports the Zoo by taking part in ZooFari. You can find about a hundred eateries, from Ardeo to Zola, at fonz.org/restaurants.htm. Please be sure to thank them for supporting the Zoo's work.



JESSIE COHEN/NZP



KIMBERLY KAUFMAN

BIRD EVENTS

A Brace of Bird Events

DELAWARE BAY FIELD TRIP

May 19, 7 a.m. | By Bus From Zoo

Journey to the shores of Delaware Bay with Smithsonian ornithologists to explore the wonders of shorebird migration. Learn more and reserve a spot at fonz.org/delawarefieldtrip.htm.

KENN KAUFMAN LECTURE

May 31, 6 p.m. | Visitor Center Auditorium

Hear this legendary birder-photographer, get signed copies of his books, and mingle with fellow bird-lovers. Learn more and buy tickets at fonz.org/birdclublecture.htm.

Wild

EDUCATIONAL OPPORTUNITIES



Don't miss your chance to participate in the area's wildest camps!

Friends of the National Zoo's Summer Safari Day Camp (at Rock Creek) and Nature Camp (in Front Royal) programs are still open for registration. Explore the lives, habitats, and conservation of animals around the world at one of the nation's top zoos!

Learn more and register at nationalzoo.si.edu/education/camps.



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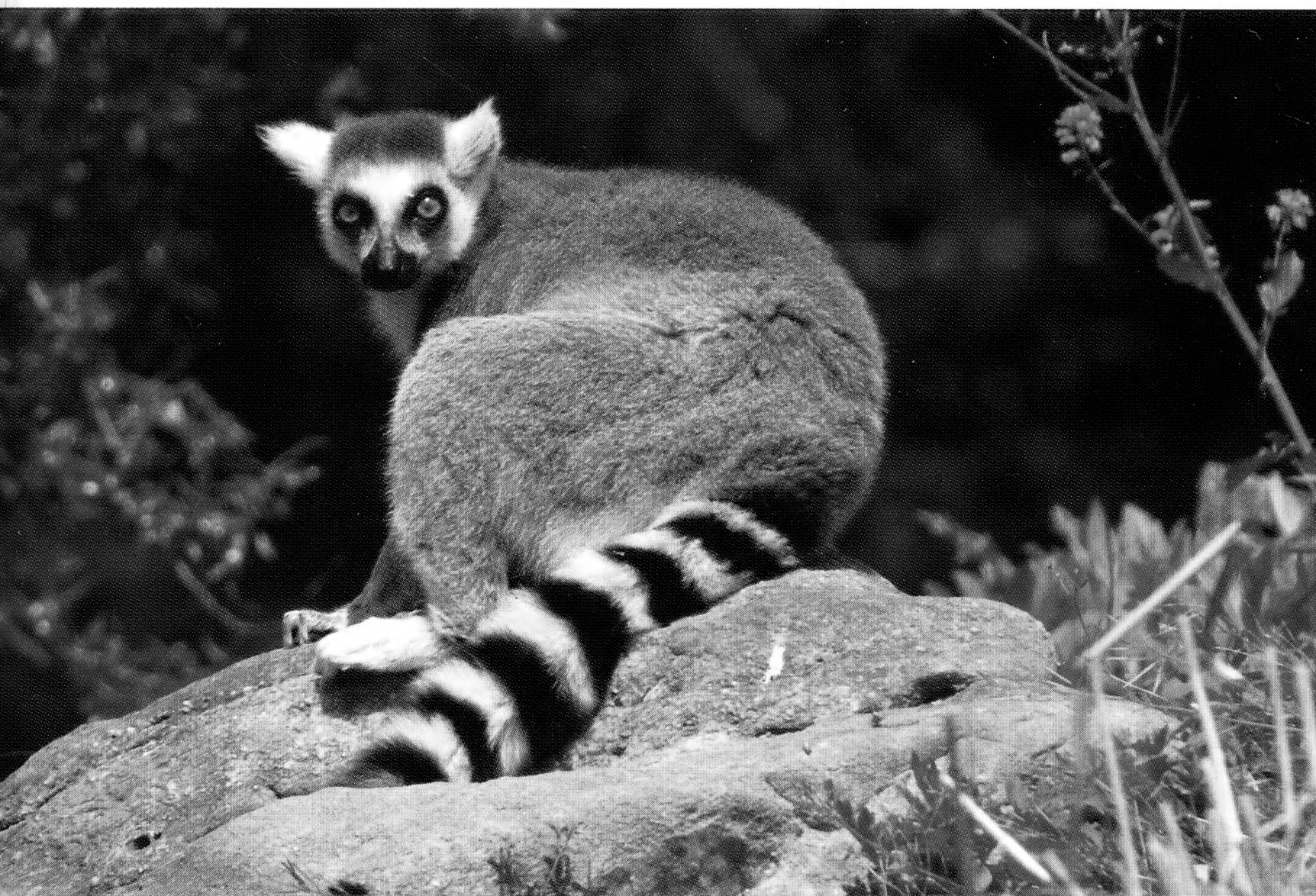
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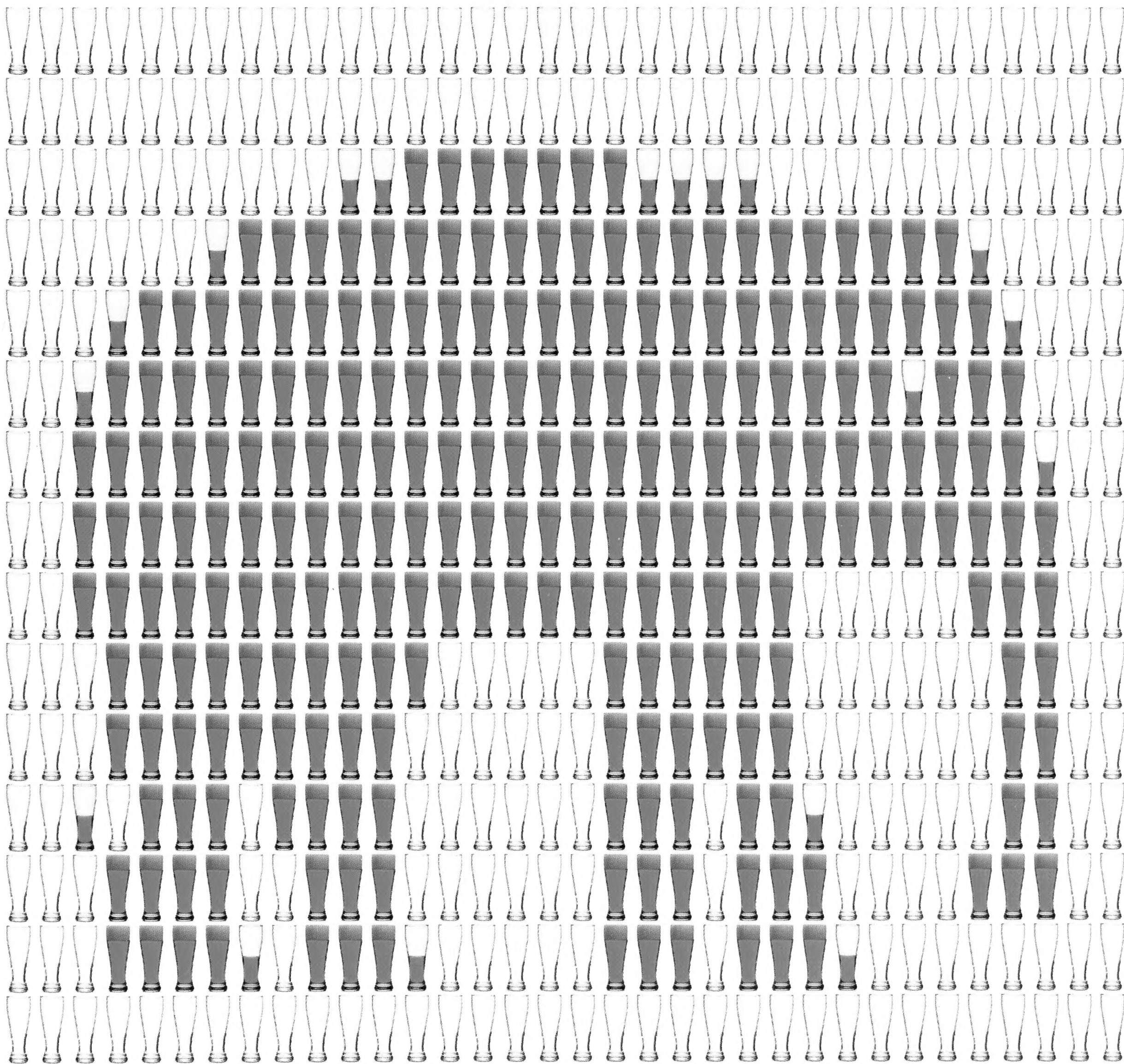
Family Photo

On March 22, a black howler monkey named Chula gave birth to a healthy baby. The young monkey, whose sex is yet unknown, is the first National Zoo-born howler to survive. Janice Sveda of the FONZ Photo Club captured this shot of the new arrival, whom you can see in the Small Mammal House.

CAMERA: Nikon D300; FOCAL LENGTH: 240 mm; EXPOSURE: 1/125 second at f/8

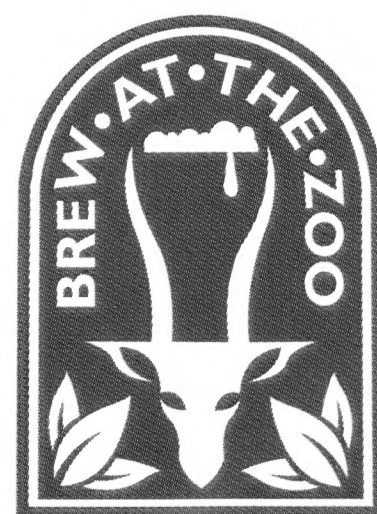
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welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to **Zoogoer@si.edu**. We will contact you if we are able to use your picture for the Zoo View page.

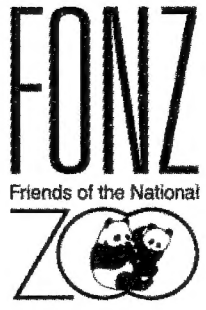


Changing the world, one beer at a time.

Join us July 12 for Brew at the Zoo and raise a glass for a good cause! Enjoy samples from 30 breweries while rocking to live music, all in the beautiful setting of the National Zoo. Tickets go on sale June 1, at fonz.org/brew.htm. All proceeds support the Zoo's conservation programs. So, get your tickets early and head to the National Zoo, where drinking beer helps save wildlife. *This is a 21+ rain or shine event. Generously sponsored by MIX 107.3.*



JULY 12, 6-9 P.M.



Friends of the National Zoo, PO Box 37012, MRC 5516, NW, Washington, DC 20013-7012, www.fonz.org

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Thank you for joining FONZ.

Your membership supports animal care,
science, conservation, and more.



**YIP
YIP
HOORAY!**

Asian small-clawed otters have returned to the Zoo. Visit Asia Trail, meet the otter family, learn their names, and enjoy the otterly delightful antics as they frolic in their new home. **Thanks to Whole Foods Market for generously providing otter transportation, enrichment, and naming support.**